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A Worldwide, Annotated Bibliography of the Variegated Cutworm

Peridroma saucia Hübner

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CONTENTS

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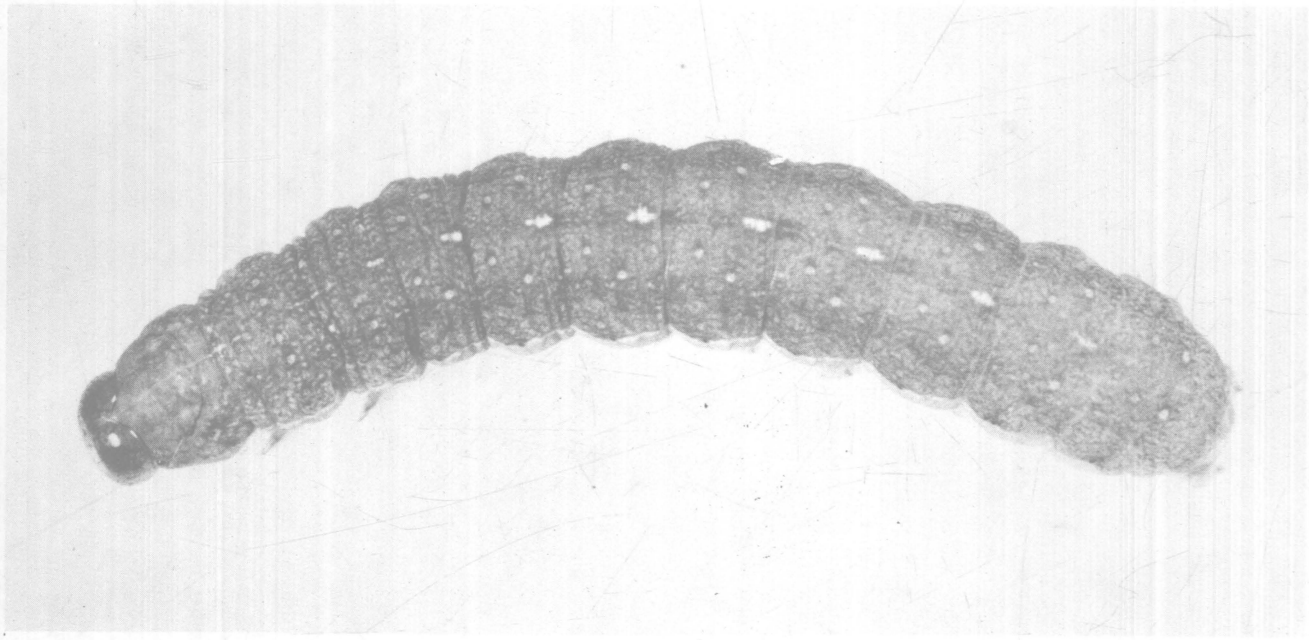

Dorsal view of Variegated Cutworm

A WORLDWIDE, ANNOTATED BIBLIOGRAPHY OF THE VARIEGATED CUTWORM, Peridroma saucia (Hübner)

Roy W. Rings[1], Beth A. Johnson[2], and Fred J. Arnold[3]

Introduction

The purpose of this circular is to consolidate the world literature on the variegated cutworm, *Peridroma saucia* (Hübner) for pest management purposes. This publication is not intended to be a comprehensive bibliography for taxonomic studies.

The literature search recovered some, but not all, checklists, faunal lists, or comprehensive publications and texts which cannot be abstracted for the recovery of a single species.

The literature search included the following abstracting journals: Zoological Record, Bibliography of the More Important Contributions to American Economic Entomology, Index to the Literature of American Economic Entomology, Review of Applied Entomology, Biological Abstracts, Bibliography of Agriculture, as well as United States and Canadian pest reporting journals. References not available in Ohio were requested from cooperating states or from the National Agricultural Library. A profile on the variegated cutworm has been established at the Mechanized Information Center at The Ohio State University Libraries. This computerized system of information retrieval will provide current references to up-date the bibliography.

The preparation of this bibliography is part of a multi-state research program[4] entitled "Bionomics and Management of Soil Arthropod Pests."

Entries are listed alphabetically by author except in cases where the publication is anonymous or more likely to be identified with a governmental agency under which it was published.

The variegated cutworm has also been called the common cutworm and the alfalfa cutworm. In the United States the moth has been designated as the Unarmed Rustic and in England it is known as the Pearly Underwing Moth, *Peridroma porphyrea* (Schiffermüller). The synonyms most often used for the scientific name are *Agrotis saucia* Treitschke, *Peridroma margaritosa* (Haworth), *Lycophotia margaritosa* Haworth, *Agrotis inermis* Harris, *Noctua saucia* Hübner, *Agrotis ortonii* Packard, *Lycophotia saucia* (Hübner), and *Peridroma margaritosa saucia* Hübner.

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The abbreviations in the citations follow the American standard for periodical title abbreviations which was published in Biological Abstracts, 45(13):4347-4361. All references in this publication deal with the variegated cutworm; however, the scientific name used in a given article is also used in the annotation so there is no question as to the species being cited. Numbers in parentheses following an annotation represent the pages which include information on the variegated cutworm if these numbers are different than the citation page numbers.

Acknowledgments

The authors are sincerely grateful to the following individuals who provided literature citations, photocopies, or reprints for the bibliography: Minister of Agriculture, Argentina; Dr. J. E. Bath, Michigan State University; Dr. C. C. Beegle, Iowa State University; Dr. M. C. Birch, University of California, Davis; Dr. G. E. Bucher, Canada Department of Agriculture, Winnipeg; Commissioner of Agriculture, State of California; Dr. C. J. Eckenrode, New York State Agricultural Experiment Station; Dr. C. R. Harris, Canada Department of Agriculture, London; Dr. A. J. Keaster, University of Missouri; Mr. J. S. Kelleher, Canadian Agricultural Insect Review, Ottawa; Dr. J. D. LaFontaine, Biosystematics Research Institute, Ottawa; Dr. J. L. Libby, University of Wisconsin; Dr. W. H. Luckmann, Illinois Agricultural Experiment Station; Librarian, MacMillan Agricultural Library, British Columbia; Dr. Z. B. Mayo, University of Nebraska; Ms. Julia S. Merrill, National Agricultural Library, U. S. Dept. of Agriculture, Beltsville, Md.; Dr. E. E. Ortman, Purdue University; Dr. L. H. Rolston, Louisiana State University; Dr. G. C. Rock, North Carolina State University; and Dr. G. W. Ware, University of Arizona. The authors are grateful to Dr. G. F. Shambaugh, OARDC, for translating German, French, and Russian; to Dr. R. N. Williams, OARDC, for translating Portuguese and Spanish; and to Mr. D. K. Nielsen, University of Oslo, Norway, for translating Norwegian.

Special thanks are due Dr. J. D. Lafontaine, Biosystematics Research Institute, Ottawa, Ontario, for his assistance in clarifying the synonomy of this species and providing technical information to support the decisions in taxonomy.

Bibliography

Aalto, A. 1972. *Peridroma saucia* Hb. (Lep., Noctuidae) found in Finland. Ann. Entomol. Fenn., 38(3):149-151.
In the late autumn of 1969, the first moth of *Peridroma saucia* was recorded in Finland. The distribution of the variegated cutworm is discussed for other countries. The adult is figured.

Aldrich, J. M. and R. T. Webber. 1924. The North American species of parasitic two-winged flies belonging to the genus *Phorocera* and allied genera. Proc. U. S. Nat. Mus., 63(2486):1-90.
Madremyria saundersii were reared from the larvae of *Lycophotia margaritosa*. (87-88)

Allen, H. W. 1925. Biology of the red-tailed Tachina-Fly, *Winthemia quadripustulata* Fabr. Miss. Agr. Exp. Sta. Tech. Bull. 12:1-30.
The variegated cutworm, *Lycophotia margaritosa*, is favored as a host species of the tachinid fly, *Winthemia quadripustulata*. The competition for host and hatching of the egg are discussed. It is a cutworm found on herbaceous plants.

Allen, H. W. 1926. Life history of the variegated cutworm Tachina Fly, *Archytas analis*. J. Agr. Res., 32(5):417-435.
The larval and adult life stages of *Archytas analis*, often a valuable parasite of the variegated cutworm (*Lycophotia margaritosa*), are discussed. The habits of the larva and adult, their seasonal cycle, relation of the parasite to its host, fecundity, distribution, hosts, and economic importance are discussed.

Allen, H. W. 1926. Observations upon the early maggot stage of *Linnaemyia comta* Fall. (Diptera: Tachinidae.) Entomol. News 37:283-286.
A study of the literature indicates that *Linnaemyia comta* is widely distributed over Europe and in North America from southern Canada to the Central American countries. Within this wide range it appears to be common, but has rarely been reported in conspicuous numbers. It has been found to be parasitic upon a number of noctuid larvae having a clandestine habit of life. Hosts include the variegated cutworm, *Peridroma saucia*. (283)

Anderson, D. M. 1975. Common names of insects (1975 revision). Entomol. Soc. Amer. Spec. Pub. 75-1:1-37.
The common name of *Peridroma saucia* (Hübner) approved by the Entomological Society of America is variegated cutworm. (29)

Anonymous. 1890. Cutworms. 20th Annu. Rep. Entomol. Soc. Ont. 1889: 1-104.
According to this article, variegated cutworms are a combination of surface and climbing cutworms. (35)

Anonymous. 1921. Las Cuncunillas. Serv. Policia Sanit. Vei. Santiago de Chile: 1-8.
The habits and control of cutworms in general are discussed. The moth of *Peridroma saucia* is illustrated.

Anonymous. 1926. Plagas de origen animal (Insetos, Acaros, etc.) Calendario de Patología Vegetal y Zoología Económica. Circ. 601:1-23.
Licophotia margaritosa (= *Peridroma saucia*) was a pest of flax in Argentina. The flax was attacked by dark gray "worms" with four to six yellow marks on the dorsum. (20) (Translated from Spanish.)

Anonymous. 1926. Principles parasitos que danan el cultivo de la alfalfa en la Republica Argentina. Argentina Minist. Agr. Circ. 645:1-17.
The "gusano cortador" (= variegated cutworm) is discussed as a pest of alfalfa in Argentina. The larva is described and the methods recommended for control included arsenical baits. (8) (Translated from Spanish.)

Anonymous. 1926. Report of the Minister of Agriculture for the Dominion of Canada for the year ending March 31, 1926. Entomological Branch:1-111.
"The outbreak of cutworms in New Brunswick was very widespread and the loss to field and garden crops severe. Several species were involved in the outbreak, the variegated being most widely destructive. Information for control was distributed in cooperation with the provincial Department of Agriculture and very important savings of crops resulted." (97)

Anonymous. 1941. Estación de Fitopatologia Agricola Memoria de los trabajos realizados. La Coruna Estac. de Fitopat Agr. Pub. 14:15-18.
Lycophotia (*Agrotis*) *saucia* (= *P. saucia*) is discussed as a pest of potatoes in northwest Spain. (Translated from Spanish.)

Anonymous. 1958. Parathion. 11th Annu. Conf. Rep. on Cotton Insect Research and Control. Memphis, Tenn., Dec. 9-11, 1957, pp. 1-71.
Parathion controlled cotton aphid, garden webworm, leafhoppers, cotton leafworm, stink bugs, and whiteflies, but gave very little control of the fall armyworm, the variegated cutworm, the bollworm, or the pink bollworm. (22)

Anonymous. 1972. Can. Agr. Res. Branch Rep., p. 24.
The variegated cutworm, *Peridroma saucia* (Hübner), caused minor damage to tobacco in Nova Scotia during September.

Anonymous. 1973. Protection of crops against pests. Can. Agr. Res. Branch Rep., pp. 23-24.
"Cutworms. Cutworms on a number of crops have been reduced by increased knowledge of identification, biology, and chemical controls. Twice as many larvae of the darksided cutworm, *Euxoa messoria* (Harr.), were found in plots of a tobacco field fall-planted with rye as in plots winter fallowed. The number of plants injured was correlated with the number of larvae found. Larvae of the variegated cutworm, *Peridroma saucia* (Hbn.), appeared 2 to 4 weeks later than those of the darksided cutworm and winter cultural methods had little effect on their numbers." (24)

Atkins, E. L. 1959. Biology and control of orange worms. Calif. Citrograph, 44: 165-171.
"The variegated cutworm, *Peridroma margaritosa* (Haw.), also causes frequent economic damage. Primary difference between this insect and the citrus cutworm is that the variegated cutworm lays its egg on, and the larvae feed on, various cover crops such as mallow and chickweed. When the cover crops begin to dry up or when it has been destroyed by larval feeding or discing under, the variegated cutworm moves to citrus trees, consuming young foliage, blossoms, and fruit. The variegated cutworm can be controlled with the same insecticides as the citrus cutworms and at the same dosages, with the important exception of parathion. Since parathion will not control this insect, it is very important that the grower know which cutworm he has in his orchard." (168)

Bade, E. 1931. Insect pests. Gard. Chron. 35:128.

"The adult of the cutworm is a grayish brown moth, or miller, often seen flying about the lights at night. The caterpillar of this moth does the damage, the injury almost invariably occurring during the Spring of the year. At this time the plants attacked are cut off at the surface, or just a little below the surface, of the ground. Since the caterpillar rests during the day and feeds at night, the damage will always be noticed early in the morning. When the soil surrounding the cut-off plant is carefully examined to a depth of about 1 inch, the culprit will be found curled up in the soil. Each moth lays from 200 to 500 eggs, the eggs hatching early in Fall a few weeks after being laid. The young cutworms begin to feed and hibernate during the Winter, when cold kills the vegetation. In the Spring, when the plants begin to sprout, the half-grown caterpillars begin to feed again and stop feeding late in June or early in July, at which time they change to their resting stage."

Baerg, W. J. 1942. Introduction to applied biology. 2nd. Ed., Burgess Pub. Co., Minn. 146 pp.
Feeding habits, appearance, distribution, seasonal and life history, and control measures for the variegated cutworm are discussed and the larva is figured. In the south-central United States, it may damage alfalfa and clover seriously. (109-110)

Beadle, L. D. and H. F. Wilson. 1938. What's new in farm science. Wis. Agr. Exp. Sta. Bull. 440:1-95.
The variegated cutworm, *Lycophotia margaritosa saucia*, was one of four cutworms found to be so abundant as to cause serious damage. Variegated cutworms made up 9 percent of the total number of cutworms picked up in field collections during 1937 at Hancock, Wis. (20)

Bensel, G. E. 1916. Control of the variegated cutworm in Ventura County, California. Sugar, 18:378-380.
"The variegated cutworm (*Peridroma margaritosa* (*saucia*) Hübn.) is widely distributed in Ventura County, California, and did considerable damage in the year 1914 to the sugar beet crop. The first serious outbreak occurred in April 1913 when about 300 acres of young beets were cut off just beneath the surface of the ground." (378) The type of damage, natural enemies, methods of control, and light traps are discussed.

Bensel, G. E. 1916. Control of the variegated cutworm in Ventura County, California. J. Econ. Entomol., 9(2):303-306.
The variegated cutworm destroyed 300 acres of sugar beets in 4 days in Ventura County, California. Natural enemies included two carabids, *Calosoma semilaeve* Lee. and *C. cancellatum* Esch. Control was obtained by dusting and spraying Paris green and by ditching.

Bertoni, A. DeW. 1947. Las orugas o gusanos cortadores que atacan a las planti as de Yerba-mate. Paraguay Min. de Agr. Cartilla Agropecuaria, 99-101:11-12.
"*Lycophotia margaritosa*" (= *P. saucia*) is discussed as an agricultural pest in Italy. Recommendations for control included 1% dusts of Paris green, calcium arsenate, or lime sulfur. (Translated from Italian.)

Bethune, C. J. S. 1908. Remarkable outbreak of cutworms. Ont. Agr. Coll. Rep. 33:54-55.
"In July much alarm was created in the neighborhood of Leamington, Ontario, by an extraordinary outbreak of caterpillars which devoured everything before them. Application was made to the President of the College for advice and assistance

and he referred the matter to the Entomological Department; Mr. L. Caesar and Mr. McMeans were at once sent up to investigate. The latter brought back specimens the following day, and the insect proved to be the variegated cutworm (*Peridroma saucia*), which has on previous occasions appeared in devastating numbers, the most serious outbreak having occurred in British Columbia and the neighboring Pacific Coast states in 1900. Near Leamington the worms were first discovered in clover fields where they soon devoured the crop and left the ground bare and black. They then marched on to the next field and consumed whatever vegetation they met; corn, tobacco, tomatoes, and other vegetables seemed special favorites for consumption. If a fruit tree happened to be in their way, they climbed it and devoured both fruit and foliage. Many peach trees were thus attacked and the fruit ruined." (54)

Bethune, C. J. S. 1908. Remarkable outbreak of the variegated cutworm. 38th Annu. Rep. Entomol. Soc. Ont.: 99-102.
On the evening of July 25, a telephone message from Leamington was received at the Ontario Agricultural College urgently asking for help against a "worm" which was devouring everything before it. These "worms" proved to be variegated cutworms. The moth, egg, and larva of *Peridroma saucia* are figured. (99)

Biezanki, C. M., R. E. Bertholdi, and O. Baucke. 1949. Relacao dos principais insetos prejudiciais observados nos arredores de Pelotas nas plantas cultivadas e selvagens. Agros, 2(3):156-213.
Peridroma margaritosa is listed as a pest of tomato (*Lycopersicum esculentum* Mill.) in Brazil.

Blickenstaff, C. C. 1965. Common names of insects approved by the Entomological Society of America. Bull. Entomol. Soc. Amer., 11(4):290.
The common name of *Peridroma saucia* (Hübner) approved by the Entomological Society of America is variegated cutworm.

Bohart, R. M. 1948. Sod webworms and other lawn pests in California. Hilgardia 17:267-308.
"The variegated cutworm, *Peridroma margaritosa* (Haw.), is about 45 mm. long at larval maturity. It is gray or brown with blotchy gray and black lateral markings and with a median row of pale, small, somewhat diamond-shaped spots. The adult has a wingspread of 37 to 47 mm. (Fig. 17,B). The forewing is a mottled dark gray or brownish gray, often with a purplish tint. In the upper middle of the wing are two indistinct eyelike spots. The hind wings are whitish to gray with dark venation." The cutworm infestations have not been controlled by poisoned baits. (298)

Bottger, G. T. and S. I. Gertler. 1949. Preliminary tests on N-substituted *m*-nitrobenzamides as insecticides. U. S. Dep. Agr., Bur. Entomol. and Plant Quarantine, E-773: 1-9.
Nineteen N-substituted *m*-nitrobenzamides, which were prepared by reacting *m*-nitrobenzoyl chloride with amines under suitable conditions, have been tested in the insecticide testing laboratories of the Bureau of Entomology and Plant Quarantine at Sanford, Fla., and Anaheim, Calif. All compounds contain in common the *m*-nitrobenzoyl group. These synthetic organic compounds were tested as dusts against three or more leaf-feeding insects. The variegated cutworm was among the insects used for these tests. (1)

Bottger, G. T. and M. Jacobson. 1950. Preliminary tests of plant materials as insecticides. U. S. Dep. Agr., Bur. Entomol. and Plant Quarantine, E-796:1-35.
Reported are the results of toxicity tests with 197 plant materials which were started at the insecticidal testing laboratory of the bureau at Sanford, Fla., and continued at Anaheim, Calif. The variegated cutworm was one of the experimental insects. (1)

Bottger, G. T. and C. Levin. 1946. Comparative toxicity to insects of benzene hexachloride and DDT. J. Econ. Entomol., 39(4):539-541.
Benzene hexachloride was less effective than DDT against *P. saucia*. BHC at 95 $\mu g/cm^2$ gave 83% mortality in 3 days, whereas DDT at 85 $\mu g/cm^2$ gave 92% mortality of fourth instars. (540)

Bottger, G. T. and C. Levin. 1947. Preliminary tests of synthetic organic compounds as insecticides. Part IV. U.S. Dep. Agr., Bur. Entomol. and Plant Quarantine, E-738:1-14.
This is the fourth report on preliminary tests with synthetic organic compounds which were conducted at the insecticidal testing laboratories of this bureau at Sanford, Fla., and Anaheim, Calif. Twenty-six compounds were tested against three or more species of leaf-feeding insects, including the variegated cutworm. (1)

Bottger, G. T. and A. P. Yerington. 1948. Preliminary tests of synthetic organic compounds as insecticides. Part V. U. S. Dep. Agr., Bur. Entomol. and Plant Quarantine, E-744:1-14.
"The results of tests of 76 compounds are included in this paper, which is the fifth of a series reporting preliminary laboratory tests to determine the insecticidal value of synthetic organic compounds. Eighteen compounds gave greater than 75 percent mortality against one or more species of insects and four (chloromethyl 4-chlorophenyl sulfone, chloromethyl phenyl sulfone, methyl-4-chlorophenyl sulfone, and 1,1,1-trichloro-2,2-bis (3,5-dichloro-2-hydroxyphenyl) ethane) were very toxic against three or more species. Only one of the 18 toxic materials caused more than slight foliage injury." (3) The variegated cutworm was one of the insects used for these tests.

Bottger, G. T., A. P. Yerington, and S. I. Gertler. 1948. Preliminary tests on N-substituted *p*-nitrobenzamides as insecticides. U. S. Dep. Agr., Bur. Entomol. and Plant Quarantine, E-764: 1-9.
Twenty-three N-substituted *p*-nitrobenzamides, which were prepared by reacting *p*-nitrobenzoyl chloride with amines under suitable conditions, were tested in the insecticide testing laboratory of this bureau at Anaheim, Calif. All the compounds had the nitro group in the paraposition. These compounds were tested as 25 percent dusts against five or more species of leaf-feeding insects. The variegated cutworm, *Peridroma margaritosa*, was one of the test insects. Of all the compounds tested, N,N-diisopropyl-p-nitrobenzamide appeared to be the most toxic to the greatest number of species.

Bottger, G. T., A. P. Yerington, and S. I. Gertler. 1949. Preliminary tests of certain phenylhydrazides as insecticides. U. S. Dep. Agr., Bur. Entomol. and Plant Quarantine, E-769: 1-4, 6-9.
The variegated cutworm, *Peridroma margaritosa*, was one of the insects used in the tests of 25 chemically related compounds derived from phenylhydrazine.

Bottger, G. T., A. P. Yerington, and S. I. Gertler. 1949. Preliminary tests of chlorinated benzamides as insecticides. U.S. Dep. Agr., Bur. Entomol. and Plant Quarantine, E-789:1-4, 6, 9-13, 15, 20.
A total of 128 chlorinated benzamides were tested as insecticides during the period from Feb. 1946 to August 1948. All compounds were tested as dusts against at least three species of insects, including the variegated cutworm. (1)

Bottger, G. T., A. P. Yerington, and S. I. Gertler. 1949. Preliminary tests of synthetic organic compounds as insecticides. Part VI. U. S. Dep. Agr., Bur. Entomol. and Plant Quarantine, E-790:1-3, 5, 7, 9-10, 15.
This is the sixth of a series of papers reporting preliminary tests with miscellaneous synthetic organic compounds which were started at the insecticide testing laboratory of the bureau at Sanford, Fla., and continued at Anaheim, Calif. In the previous papers (E-621, E-684, E-729, E-738, and E-744), tests with approximately 1,200 compounds are reported. This paper gives the results obtained from 89 compounds not previously reported and which were tested from Jan. 1946 to March 1949. The variegated cutworm was used for these tests. (1)

Bouhélier, R. 1938. A propos de la contre *Rhyacia saucia* Hbn. Revue de Zool. Agricole, 37(8):122-123.
The damage to various cultivated plants in French Morocco by the variegated cutworm is described. The author believed that fluosilicate powders or barium carbonate, which have been proven effective for the beet armyworm, would control the larvae of *Rhyacia* (= *Peridroma*) *saucia*. (Translated from French.)

Bowles, G. J. 1880. Canadian cut-worms. 10th Annu. Rep. Entomol. Ont. 1879: 1-89.
The unarmed rustic moth larva, the variegated cutworm, so closely resembles the *Agrotis saucia* of Europe that many entomologists consider them identical. *Agrotis inermis* (= *P. saucia*) is common over Canada and the northern and western states. (41)

Boyd, N. R., Jr. and B. W. Arthur. 1960. Biological degradation of O, O-diethyl O-napthalimido phosphorothioate (Bayer 22408). J. Econ. Entomol., 53(5):848-853.
The stability and metabolism of several phosphorothioates have been investigated in mammals and insects. O, O-diethyl O-naphthalimido phosphorothioate (Bayer 22408) is a new phosphorothioate which compares favorably with the least toxic of the organophosphates to mammals and is highly effective against many species of insects. The study reported here with Bayer 22408 concerns its absorption, distribution, stability, and characterization of metabolites in white rats, cotton plants, and several species of insects. Insect metabolism was studied in the variegated cutworm, *Peridroma margaritosa*.

Briggs, J. D. 1958. Humoral immunity in lepidopterous larvae. J. Exp. Zool., 138(1): 155-188.
Peridroma margaritosa was used in experiments to determine humoral responses exhibited as agglutinins.

Brimley, C. S. 1938. The insects of North Carolina. N. C. Dep. Agr. 560 pp.
"*L. margaritosa saucia* Hbn. Variegated Cutworm, Statewide, whole season." (270)

Brittain, W. H. 1927. Injurious insects of Nova Scotia. Nova Scotia Dep. Nat. Res. Bull. 12: 65-66.
Cutworms in general are discussed. The variegated cutworm is shown in Figure 30. Instructions are given for the preparation of a poison bran mash containing Paris green or white arsenic.

Brittain, W. H. and A. D. Pickett. 1938. Injurious insects of Nova Scotia: insect pests of garden and field crops. Nova Scotia Dep. Agr. Bull. 12: 1-159.
The description, type of injury, life history, habits, and control of the variegated cutworm are described. (5-7)

Britton, W. E. 1902. First report of the state entomologist. Carnations injured by the variegated cutworm. Conn. Agr. Exp. Sta. Rep. 1901: 227-278.
During January 1901, caterpillars of this species (variegated cutworm) attacked a bench of carnations which were grown for experimentation. For the most part the injury was on the flower buds.

Britton, W. E. 1934. Connecticut state entomologist thirty-third report 1933. Conn. Agr. Exp. Sta. Bull. 360: 385-486.
During 1933 there was more than the usual amount of injury by cutworms and climbing cutworms, particularly the variegated cutworm, *Lycophotia margaritosa saucia* (Hübn.), which caused severe injury to pepper and other vegetable and flowering plants. The variegated cutworm severely injured pepper plants at Southington in June.

Brock, J. A. 1937. Sugar beet insects and their control. Sugar Beet J., 2:147.
"While we have numerous species of cutworms, the species which appears to do the most damage to sugar beets in the eastern area is the Variegated Cutworm (*Peridroma margaritosa* Haw.). The progenitor of this cutworm is a rather large grayish-brown moth or 'miller,' and the full-grown cutworm measures about 1-3/4 inches." Methods of control by using poisoned baits are discussed.

Brodie, D. A. 1901. Potato blight and its treatment. Wash. Agr. Exp. Sta. Bull. 46: 1-15.
"During the latter part of July, this section of the country was overrun by a species of the cutworm family, *Peridroma saucia*, which, though not as destructive on the station as in portions of the surrounding country, did some damage in parts of this particular field. It was noticed that the rows which had received two applications of Bordeaux were left untouched by the insect, while the leaves and stems of the untreated rows were totally destroyed. In other words, the blight had not quite completed its work before the cutworm came in and hastened the total destruction." (11)

Burgess, A. F. and C. W. Collins. 1912. The value of predaceous beetles in destroying insect pests. U. S. Dep. Agr. Yearbook 1911: 453-466.
"One of the California species, *Calosoma semilaeve* Lec. (Pl. LVII, Fig. 7), is a ground form and feeds on caterpillars in cultivated land. Mr. H. M. Russell of the Bureau of Entomology informs us that during the spring of 1910 he captured a larva of this species which was feeding on a cutworm, *Peridroma margaritosa* Haw., in a sugar-beet field near Compton, Calif. He was able to rear the adult beetle from the larva, so there is no doubt about the identity of the species. Several other species of *Calosoma* are found in the United States, but we have not had an opportunity to study the specimens." (459)

Burgess, A. F. and C. W. Collins. 1917. The genus *Calosoma*. U. S. Dep. Agr. Bull. 417: 1-124.
"Dr. A. W. Morrill has found that *Calosoma peregrinator* Guér. in both the adult and larval stages is common as an enemy of the variegated cutworm (*Peridroma margaritosa* Haw.) in Arizona, and the late H. M. Russell of this bureau reported finding adults of *C. semilaeve* Lec. at Hollywood, Calif., April 7 and 27, 1911, feeding upon the larvae of *Peridroma margaritosa* under pea vines. This indicates

that the food habits of these two species of *Calosoma* are very similar to those of *C. calidum* in both the adult and larval stages." (7)

Butler, A. G. 1882. Heterocerous lepidoptera collected in Chile by Thomas Edmonds, Esq. Trans. Entomol. Soc. London 1882: 113-139.
"19. *Agrotis saucia*. *Noctua saucia*, Hübner, Samml. Europ. Schmett, Noct. Fig. 378 (1793-1827). Var. *Agrotis ambrosioides*, Walker, Cat. Lep. Het., xi., p. 738 (1857). Var. *Spaelotis stictica*, Blanchard, in Gay's 'Fauna Chilena,' vii., p. 73, n. 1; pl. 6, Fig. 8 (1854). *Agrotis impacta*, Walker, Cat. Lep. Het., x. p. 337, n. 71(1856). With the typical form is also the slight variety figured by Hübner under the name of *N. aequa*, but which hardly differs sufficiently to need the separate line and brief description given to it by Staudinger; the form named by Walker *A. ambrosioides*, although it has the primaries of the latter slight variety, differs entirely in the coloration of the secondaries, which are pearly white, semi-transparent, with dark brown outer border and veins; lastly, the *Spaelotis stictica* of Blanchard has the secondaries of typical *A. saucia*, but the primaries are of a greyish or reddish brown colour; the whole surface covered with fine blackish mottling, and with the discoidal spots and all the paler areas of these wings white, thus giving the wings the general appearance of lichenspotted bark." 126-127.

Caesar, L. 1927. Insects attacking vegetables. Ontario Dep. Agr. Bull. 325: 6-8.
The variegated cutworm, *Lycophotia margaritosa*, is one of the most common cutworms. Types of injury, life history, and control of these cutworms are discussed.

Caesar, L. and W. A. Ross. 1926. 56th Annu. Rep. Entomol. Soc. Ont.: 1-108.
"Cutworms. The total loss from cutworms this spring was not exceptional, but there were a number of districts where there were small outbreaks, the most damage being done in New Ontario where the variegated cutworm (*Peridroma margaritosa*) and the black army cutworm (*Noctua fennica*) were the main species seen. The latter did considerable damage in some other districts to alfalfa and sweet clover." (16)

Callahan, P. S. and J. B. Chapin. 1960. Morphology of the reproductive systems and mating in two representative members of the family Noctuidae, *Pseudaletia unipuncta* and *Peridroma margaritosa*, with comparison to *Heliothis zea*. Ann. Entomol. Soc. Amer., 53(6):763-782.
"The gross morphology of the reproductive system is described and illustrated for the male and female of *Pseudaletia unipuncta* (Haw.) and *Peridroma margaritosa* (Haw.), and comparisons are made with *Heliothis zea* (Boddie). Each of these species is a member of a separate subfamily and their adults are, respectively, long, medium, and short-lived. The method of inserting the spermatophore is described and both morphological and functional reproductive characteristics are compared and summarized. Mating percentages are given for feral populations." (763)

Calvino, M., R. Ramirez, and J. Riquelme Inda. 1920. El jitomate y sus enfermedales. (The tomato and its diseases and pests.) Dirección Agric. Mexico N.S. Bol. 107:1-72.
Peridroma saucia is known as the "gusano pinto" in Mexico and is common in northern Sonora, Durango, Veracruz, and Coatepec. (42)

Cameron, A. E. 1945. Insect pests of 1944. Trans. Highl. Agr. Soc. Scot. 57:54-72.
The pearly underwing, *Agrotis saucia*, is not commonly found to be a pest of glasshouse crops. The moth is figured and the larva and adult are described.

Cameron, A. E. 1946. Insects and other pests of 1945. Trans. Highl. Agr. Soc. Scot. 58:100-120.
The pearly underwing, *Agrotis saucia*, is not commonly found to be a pest of glasshouse crops. The moth and larva are described and the moth is figured.

The Canadian Agricultural Insect Pest Review

This publication aims to present, in manuscript form, a periodical statement on current insect pest conditions. It presents data governing the seasonal appearance, the effects of winter, degrees of parasitism, notes on distribution and abundance of insect pests. It has been published by the Canada Department of Agriculture, Research Branch--Scientific Information Section, Ottawa, Ontario, from 1923 to present. From 1923 to 1967, this publication was known as the Canadian Insect Pest Review.

1924. Can. Insect Pest Rev. 2.
"The variegated cutworm, *Peridroma margaritosa* form *causia* Hbn., has been causing injury to cauliflower heads near Wolfville, N.S." (47) "On page 47, paragraph 5, '*Peridroma margaritosa* form *causia* Hbn.' should read..... form *saucia* Hbn." (77)

1925. Can. Insect Pest Rev. 3.
"Cutworms, believed to be the variegated cutworm, *Lycophotia margaritosa* Haw., (*Peridroma saucia* Hbn.) have been doing considerable injury to the foliage and fruit of tomatoes at Vernon, B. C., seriously reducing the fruit tonnage." (37)

1926. Can. Insect Pest Rev. 4.
"The most abundant and injurious species of cutworm in New Brunswick during 1925 is believed to be the variegated cutworm, *Lycophotia margaritosa* Haw., which caused extensive damage to seedling field and garden plants throughout the St. John river valley and parts of the eastern coast of the province." (3)

1928. Can. Insect Pest Rev. 6.
"The variegated cutworm, *Lycophotia margaritosa* Haw., was troublesome in a greenhouse at Saskatoon, Saskatchewan, during Nov. 1927. Damage by this species to crops grown in the open has not been recorded in Saskatchewan for many years." (1)

1929. Can. Insect Pest Rev. 7.
Many larvae of *Lycophotia margaritosa* Haw. were found associated with *Heliophobus procinctus* Grote where they attacked timothy, oats, clover, and alfalfa in British Columbia. (3)

1930. Can. Insect Pest Rev. 8.
Climbing cutworms (probably *Lycophotia margaritosa* Haw.) are appearing in some numbers on tomatoes at Agassiz, B.C. (59) The variegated cutworm, *Lycophotia margaritosa* Haw., occurred on beets and mangels at Meteghan, Digby County, N.S. (73)

1934. Can. Insect Pest Rev. 12.
"The variegated cutworm, *Lycophotia margaritosa* Haw., caused severe defoliation of calendula, salvia, dahlia, and seedlings, and bud injury to carnations in greenhouses in St. John, N.B., and Halifax and Yarmouth, N.S. In one greenhouse, one-eighth of carnation buds were destroyed on 5,000 square feet of bed;

in an iris bed nearly all buds were destroyed. In a greenhouse at Halifax, six cutworms per square foot of bed were found and five in one flat of seedlings." (64-65) "A severe infestation of the variegated cutworm, *Lycophotia margaritosa* Hb., causing partial defoliation of bench and potted plants and injury to buds of carnations, occurred in a greenhouse at Sussex, N. B." (120)

1935. Can. Insect Pest Rev. 13.
The variegated cutworm, *Lycophotia margaritosa* Haw., was troublesome in a number of greenhouses in March, April, and May in New Brunswick. (34) Specimens of a climbing cutworm, almost undoubtedly the variegated cutworm, *Lycophotia margaritosa* Haw., have been sent in from Elrose, Sask., where considerable damage was being done to green tomatoes in the garden. (167)

1936. Can. Insect Pest Rev. 14.
The variegated cutworm, *Lycophotia margaritosa* Haw., was associated with the spotted cutworm in damaging sugar beets, white clover, corn, beans, alfalfa, and grain. Compared to the number of spotted cutworm larvae, there were very few variegated larvae in Ontario. (48) A fairly heavy infestation of the variegated cutworm, *Lycophotia margaritosa* Haw., occurred on greenhouse tomatoes in a greenhouse in London, Ont.; feeding was confined mostly to the foliage. A few cutworms of this species are generally noticed each year toward the close of the tomato season. Serious injury was occasioned by the variegated cutworm in a greenhouse at Grimsby, Ont. The tomato fruit was heavily attacked, while many carnation buds and the crowns of young chrysanthemum plants were eaten away. The injury has apparently all been caused by the one species which, judging by sample larvae collected, should be referred to as the above species. Apparent success in control was obtained. (123)

1937. Can. Insect Pest Rev. 15.
The variegated cutworm, *Lycophotia margaritosa* Haw., was moderately abundant in western Ontario. (33) About mid-July, *L. margaritosa* Haw. was found attacking peach and filbert nut trees at Vineland, Ont. The trees were planted in spring in alfalfa sod and only the tree rows were cultivated. With the drying out of the strips of alfalfa between the trees due to the hot, dry weather, the cutworms in the alfalfa were forced to migrate to and concentrate on the trees. At the base of one peach tree as many as 35 cutworms were found. (40) Larvae of the variegated cutworm, *Lycophotia margaritosa* Haw., were sent in from Meadow Lake, Sask. (108) Infestations of the variegated cutworm, *Lycophotia margaritosa* Haw., occurred on tomatoes and asparagus ferns in greenhouses in London, Ont. The crop of tomatoes was nearly finished at the time of observation. The worms were not very abundant but ruined a number of tomatoes in various parts of the greenhouses. Some of the ferns were badly stripped. The variegated cutworm was very abundant during the latter half of July throughout the district of Essex, Kent and Lambton counties, Ontario, on sweet clover, sugar beets, onions, potatoes, tomatoes, and garden flowers. Control measures were necessary to save crops in the district of Harrow in Essex County and Blackwell district in Lambton County. The variegated cutworm has been reported to have destroyed several fields of oats and wheat at scattered points in the Red River Valley, Manitoba. This insect is being poisoned quite extensively in Minnesota. Heavy damage has been done by a species of cutworm at a local seed farm at Victoria, B.C. The caterpillars bored into the seed capsules, causing 100 percent damage in many cases. The species is probably *Lycophotia margaritosa saucia* Hbn. (160)

1938. Can. Insect Pest Rev. 16.
"The glassy cutworm, *Sidemia devastator* Brace, and the variegated cutworm, *Lycophotia margaritosa* Hübner, were abundant in a few localities in Ontario,

but there was no general outbreak." (35) "The variegated cutworm, *Lycophotia margaritosa* Haw., is a very serious pest in Prince Edward Island. Every year control measures have to be undertaken before transplanting. One tobacco seedbed in the Chatham district of Ontario was severely injured by the variegated cutworm." (158) "The variegated cutworm, *Lycophotia margaritosa* Haw., is an annual pest in the province of Prince Edward Island. The numbers are very much less than last year." (196)

1939. Can. Insect Pest Rev. 17.
The variegated cutworm, *Lycophotia margaritosa saucia* Hbn., was probably the most common cutworm and was frequently found in the same fields with the armyworm. It also caused some damage in greenhouses and on celery. (40) "The variegated cutworm, *Lycophotia margaritosa* Haw., is usually a serious pest in gardens all over the province of Prince Edward Island, but for the past 2 years the damage has been slight." (173)

1940. Can. Insect Pest Rev. 18.
"About 25 percent of tomato plants in one garden near Charlottetown, Prince Edward Island, have been destroyed by the variegated cutworm, *Lycophotia margaritosa* Haw. Reports have come in from around Charlottetown that cutworms are destroying their whole vegetable crop. This is probably somewhat exaggerated. Infestation is about the same as last year." (133) Every garden in the vicinity of Charlottetown, Prince Edward Island, shows some injury from cutworms, *Lycophotia margaritosa* Haw. "In the garden near Milton a very heavy infestation was noted; about 25 percent of the plants were destroyed." (184-185) "An outbreak of the variegated cutworm was reported from Courtenay, B.C., where it is seriously damaging a large acreage of potatoes." Forestry officers at Campbell River also sent in specimens of the same species which were injuring seedlings of Western cedar. Cutworms were numerous in 1940 on Vancouver Island, B. C., and complaints were received from all districts. Most of the complaints referred to the variegated cutworm, *Lycophotia margaritosa* Haw., but some larvae were sent in which appeared to be *Euxoa excellens*. At Courtenay, fields of potatoes were badly damaged and some damage occurred among potatoes on the Saanich peninsula. (185) "The extent of damage to general farm and garden crops by the variegated cutworm, *Peridroma margaritosa* Haw., at Fernie, Kaslo, New Denver, Edgewood, Blue River, Kamloops, and Quilchena, B. C., is difficult to estimate, as in most cases reports only have been obtained. The most severe damage appears to be in small gardens, the pest not being widespread in any one area, and the most severe injury reported has been to green tomatoes." (243)

1941. Can. Insect Pest Rev. 19.
Cutworms were moderate in numbers throughout the Dominion except for British Columbia. In that province, 1940 was one of the worst cutworm years on record and reports of severe damage were received from many points. The species involved on Vancouver Island and on the lower mainland and coastal areas to the north was the variegated cutworm, *Peridroma margaritosa saucia* Haw. Potatoes, peas, and general truck crops were totally defoliated in many cases. (2) "The summer generation of the variegated cutworm, *Peridroma margaritosa* form *saucia* Hbn., was particularly abundant and destructive. The East Kootenays appeared to be particularly badly infested, but much damage was done also at some points in the interior, such as Kamloops, where tomato plants and other vegetables were badly attacked. A considerable amount of poisoned bait was put out by the Chinese growers, but in most cases the major part of the damage had been done before control was begun." (81) "The Lower Fraser Valley in British Columbia was marked by an unusual outbreak of the variegated cutworm, *Peridroma margari-*

tosa saucia Haw." (84) "The cutworm *Peridroma margaritosa saucia* Haw., was very abundant and in some places considerable damage was done." At Courtenay, B. C., 30 acres of potatoes were badly damaged. (87) "*Peridroma margaritosa* Haw. were reported to be numerous in beds of seedling conifers at the Campbell River Forest Nursery, Campbell River, B. C. Egg masses were numerous on the wooden slats of the shade frames." (90) "The variegated cutworm, *Peridroma margaritosa* Hbn., has been damaging grape vines, flower gardens, and asparagus at the Kamloops city gardens in Ontario. There has been an unusually early attack on these plants, but as yet there has been no serious loss. Some grape vines and many buds have been destroyed. Cutworm injury was severe in many parts of British Columbia last year, the variegated cutworm being responsible for most damage. Late in the season parasitism was found to be high in many districts. Fewer reports of injury have been received this year." (131)

1942. Can. Insect Pest Rev. 20.
There was not a recurrence of the severe 1940 outbreak of the variegated cutworm, *Lycophotia margaritosa* Haw., in British Columbia. Only scattered reports of damage were received in 1941. (4) "The main species was the variegated cutworm, *Lycophotia saucia* Hubn." In April some damage was done to grape vines, asparagus, and flower gardens in the city of Kamloops, B.C., and during May there was a patchy infestation in the truck crop area around Kamloops, necessitating the replanting of some tomatoes and cabbage. (100)

1944. Can. Insect Pest Rev. 22.
"Variegated cutworms (*Peridroma margaritosa* Haw.) caused considerable damage in Arkansas." (168) "In a number of gardens visited at Charlottetown (Prince Edward Island) and vicinity during June, less than 1 percent of the cabbage and tomato plants were cut by cutworms, *Peridroma margaritosa* (Haw.), this season. Usually a serious pest in this province but this year the numbers were so small that in only rare cases was it necessary to apply poison bait." (184)

1945. Can. Insect Pest Rev. 23.
"Climbing cutworms, in some cases the variegated species, *P. margaritosa* Haw., have attacked tomatoes in several parts of the province of Ontario, boring into the fruit and rendering it useless. More cases of this type of injury were reported that season than in the previous year." (185) "The variegated cutworm, *Peridroma margaritosa* var. *saucia*, was very abundant throughout the district surrounding Chatham, Ont., during the early and middle part of July. It was present in most clover and alfalfa fields and damaged such crops as tobacco and tomatoes. It was also present in the flower and vegetable gardens and did considerable damage in these locations. The variegated cutworm has been quite abundant in western Ontario as well as in Prince Edward County during the past month. Partially ripened tomatoes were attacked by the large worms and big cavities were eaten into them, thus spoiling them for processing. The cutworms were abundant enough in some fields to necessitate spraying for their control before serious damage resulted to the crop of tomatoes. In western Ontario the worms were numerous in alfalfa and clover fields, where they spread, after the hay was cut, to tobacco fields." (185-186)

1946. Can. Insect Pest Rev. 24.
"In Ontario the only species, with the exception of the armyworm, reported causing economic loss was the variegated cutworm, *Peridroma margaritosa* Haw., which damaged tobacco, tomato, and flower and vegetable garden crops in southwestern Ontario, and attacked tomatoes in several parts of the province, boring into the fruit and rendering it useless." (3) Variegated cutworms, *Peridroma margaritosa*, were scarce and only a few reports of damage were received. (11)

Injury by cutworms was not particularly significant in the spring of 1945. Later in the season, however, climbing cutworms, in some cases the variegated cutworm, *Peridroma margaritosa* Haw., attacked tomatoes in several parts of the province of Ontario, boring into the fruit and rendering it useless. More cases of this type of injury were reported than in any year previous to this. (36) The variegated cutworm, *Peridroma margaritosa* Haw., was very abundant throughout the district surrounding Chatham, Ont., during the early and middle parts of July. It was present in most clover and alfalfa fields and damaged such crops as tobacco and tomatoes. The insect was also present in the flower and vegetable gardens and did considerable damage in these locations. (54) In British Columbia, various species of cutworms, including the red-backed (*Euxoa ochrogaster* Guen.) and the variegated (*Peridroma margaritosa* Haw.), caused serious losses to onion, lettuce, carrot, cabbage, grape, and young orchard trees in the Okanagan Valley, the Boundary District, and Kamloops, with the Grand Forks area most seriously affected. They were more numerous in 1946 than they had been for some time. (157) The variegated cutworm, *Peridroma margaritosa* Haw., was more prevalent than usual in gardens generally. About 3% of the plants in the Charlottetown district of Prince Edward Island were cut. (178) In New Brunswick, a light infestation of the variegated cutworm, *Peridroma margaritosa* Haw., caused some loss of seedling beets, mangels, and turnips at Maugerville and Jemseg. (210) In Prince Edward Island, *Peridroma margaritosa* (Haw.) was less prevalent than usual, causing minor damage in gardens. (347)

1947. Can. Insect Pest Rev. 25.
In Prince Edward Island, the variegated cutworm, *Peridroma margaritosa* Haw., caused early injury in the vicinity of Charlottetown to about 25 percent of the transplants in some gardens. (127) In Prince Edward Island, in gardens in the vicinity of Charlottetown, it was estimated that about 6 percent of cabbage and tomato transplants were cut by the variegated cutworm, *Peridroma margaritosa*. Cucumbers have been moderately damaged and in some cases as many as 10 percent of the plants have been destroyed. Populations were above normal. (152) The variegated cutworm was not particularly abundant in 1947 in British Columbia. (319)

1948. Can. Insect Pest Rev. 26.
In British Columbia, the variegated cutworm, *Peridroma margaritosa* Haw., was not particularly abundant in 1947. (4) Reports were received from all over Prince Edward Island that the variegated cutworm, *Peridroma margaritosa*, was causing severe damage in gardens. In the vicinity of Charlottetown, an average of 10 percent of the cabbage and turnip plants were destroyed. Cucumbers were attacked in some areas but damage was checked with poison bran bait. (141) In Ontario the variegated cutworm, *Peridroma margaritosa* Haw., caused moderate damage to tobacco leaves in several fields near Chatham and Cedar Springs. The population seemed considerably less than that of the black cutworm, hence the moderate damage. "It was prevalent in Chatham gardens during late July and injury, although not severe, was done to some vegetables and flowers. It was found feeding inside head lettuce in a Chatham garden." Much damage was caused, particularly in gardens in central Hastings County. (173) In Prince Edward Island the variegated cutworm, *Peridroma margaritosa*, caused considerable damage early in July all over the province. Injury was confined mainly to cucumbers, cabbage, and tomato plants. In one field of cucumbers near Charlottetown, 38 percent of the plants were cut. (174) At Agassiz and Vedder Crossing, B. C., 50 percent of the truck crops, particularly beets, were destroyed by the variegated cutworm. This cutworm continued to infest gardens in Chatham, Ont., during the early part of August, doing serious damage to the fruit of tomatoes.

Foliage injury to various weeds and garden plants was quite noticeable. (219) In Ontario more than the usual numbers of reports were received at the Chatham laboratory concerning the damage to tomatoes in home gardens which may be attributed to the variegated cutworm. (226) Tomatoes in a number of greenhouses in the Leamington area of Ontario showed traces of injury by the variegated cutworm, *Peridroma margaritosa*. There was no way of knowing whether or not all of the injury was caused by the insect but it was the only cutworm observed. A few plants showed as high as 50 percent foliage with injury, and in extreme cases 25 percent of this had been destroyed. It is doubtful if any crop loss resulted. (269)

1949. Can. Insect Pest Rev. 27.
The variegated cutworm, *Peridroma margaritosa* Haw., was also more abundant than usual under conditions of flooding in the Lower Fraser Valley in British Columbia. (5) Variegated cutworm, *Peridroma margaritosa* Haw., was usually numerous in Kent County, Ont. Tobacco generally was only moderately damaged, but injury on individual plants was often very severe. (63) The variegated cutworm, *Peridroma margaritosa* Haw., was present in normal numbers in Kent County, Ont., fields and gardens. (158) Serious damage by the variegated cutworm occurred in gardens and cucumber fields. *Peridroma margaritosa* Haw., was reported from all over the province of Prince Edward Island. In an area east of Charlottetown along the north side of the province, serious damage was caused to grain fields, especially where potatoes were grown during the previous season. In some fields the crop was completely destroyed, whereas in others they just thinned the grain. Damage to grain had never before been observed in Prince Edward Island. (159)

1950. Can. Insect Pest Rev. 28.
Variegated cutworms, *Peridroma margaritosa*, were present in about normal numbers during July in Kent County, Ont., gardens and tobacco fields. Damage was not severe. (50) Cutworms, particularly the variegated cutworm, *Peridroma margaritosa* Haw., were fairly numerous early in the season, causing damage to cabbage and tomato transplants all over Nova Scotia. (86) Cutworms, *Agrotis ypsilon* Rott. and *Peridroma margaritosa* Haw., were present in very large numbers during the latter part of June in the eastern part of Prince Edward Island. They caused serious damage to grain; in some fields the crop was completely destroyed. (88) During the last few days of May, a few half-grown variegated cutworms, *Peridroma margaritosa* Haw., were seen in gardens around Charlottetown, Prince Edward Island, but no reports of damage were received. (101)

1951. Can. Insect Pest Rev. 29.
Cutworms, especially the variegated species, *Peridroma margaritosa* Haw., were generally abundant in 1950 in Nova Scotia, causing considerably more injury than they had for a number of years. (99) Cutworms, mainly *Peridroma margaritosa* Haw., were very abundant in vegetable gardens and caused considerable damage throughout Prince Edward Island. (101) A severe infestation of the variegated cutworm, *Peridroma margaritosa* Haw., on chard, lettuce, and chrysanthemums grown in greenhouses was noted at Falmouth and Dartmouth, N. S. The plants were considably damaged. (133) The variegated cutworm, *Peridroma margaritosa* Haw., caused severe damage in vegetable gardens throughout Prince Edward Island. Some fields of cucumbers were severely damaged. (180) Cutworms, possibly *Peridroma margaritosa* Haw., severely damaged sugar beet seedlings in the Ladner area, B. C., making reseeding necessary in some fields. (206) Small numbers of nearly mature *Peridroma margaritosa* larvae were found feeding inside the fruit of green peppers in a garden at Kentville, N. S. Injury was very light. (230)

1952. Can. Insect Pest Rev. 30.
The variegated cutworm, *Peridroma margaritosa* (Haw.), was occasionally reported well into September in Nova Scotia. (101) Cutworms, mainly *Peridroma margaritosa* Haw., were quite numerous in gardens and caused considerable damage throughout Prince Edward Island. (106) "A moderate infestation of the variegated cutworm, *Peridroma margaritosa* Haw., on sugar beets caused damage varying from a trace to 100 percent, with an average loss of 25 to 30 percent in about 300 acres of this crop in southwestern Ontario. Loss in corn and tobacco was much less severe. The report was based mainly on crops in Kent County." Damage to sugar beets was the most severe on record. (149) "Damage by the variegated cutworm, *Peridroma margaritosa* Haw., was very light and well below average this season." (150)

1953. Can Insect Pest Rev. 31.
Several cornfields in British Columbia were infested with the variegated cutworm, *Peridroma margaritosa* (Haw.), and had to be reseeded. This species also caused considerable damage to greenhouse tomatoes at Nanoose Bay, B. C. (2) A mixed population of cutworms, predominantly the variegated cutworm, *Peridroma margaritosa* (Haw.), attacked sugar beets in the Chatham-Wallaceburg area of Ontario in June. Damage varied from a trace to complete destruction in a few fields. Some damage also occurred in tobacco and vegetable crops. (60) Cutworms, mainly *Peridroma margaritosa* Haw., were not numerous in gardens this season in Prince Edward Island and only slight injury was noted. (109) The variegated cutworm, *Peridroma margaritosa* (Haw.), caused very little damage this season and losses were negligible. Infestation was the lightest recorded in several years in Prince Edward Island. (168)

1954. Can. Insect Pest Rev. 32.
Cutworms, mainly the variegated cutworm, *Peridroma margaritosa* (Haw.), were not numerous in gardens this season and losses were negligible. It was the lightest infestation in a number of years in Prince Edward Island. (114) Very little damage by the variegated cutworm, *Peridroma margaritosa*, was noted that year in Prince Edward Island. Infestation was considerably lighter than usual (166) A moderate outbreak of the variegated cutworm, *Peridroma margaritosa* (Haw.), was observed on a variety of plants, particularly tomatoes in the Renfrew area of Ontario, and it was believed that the species was common throughout the Ottawa Valley. (202) Moderate infestations of the variegated cutworm, *Peridroma margaritosa* (Haw.), occurred on tomatoes and ornamentals in central and southwestern Ontario from Port Hope to Wallaceburg and Windsor. In some areas damage was reported to be severe. This cutworm species was widespread that season, including an area from Essex, Kent, and Lambton counties eastward to Ottawa. Damage was particularly severe in home gardens, especially on tomatoes. An outbreak of the variegated cutworm occurred in eastern Ontario. It began before the outbreak of the armyworm had fully run its course; hence the two species were confused to some degree in reports by gardeners. Numerous reports of its damage were received at Ottawa and Picton, Ont., in the week of August 1. "Injury was chiefly to tomatoes which were destroyed by borings in the fruit. Considerable damage was caused to canning crop tomatoes in Prince Edward County and to at least one field of peas of 8 acres in the Renfrew area. At Ottawa, most of the damage reported was to tomatoes in 'backyard' gardens. It also caused widespread damage to flowering annuals and perenials, especially petunias; it may destroy almost all the blossoms of petunias in an entire planting within a few nights." (234) In Quebec, a number of adults of three species of pest cutworms, the armyworm, *Pseudaletia unipuncta* Haw., the variegated cutworm, *Peridroma margaritosa* (Haw.), and the black cutworm, *Agrotis ypsilon* Rott.,

were collected by a Northern Insect Survey party at Indian House Lake 56° 4' N. Lat., 64° 44' W. Long. The two former species were present in outbreak numbers in agricultural regions of eastern Canada during the year. A gravid female of the variegated cutworm was taken at Sugluk, 62° 12' N. Lat., 75° 38' W. Long., approximately 1,200 miles north of Ottawa. These records represent points many hundreds of miles north of localities from which the insect was formerly reported. (269)

1955. Can. Insect Pest Rev. 33.
The variegated cutworm, *Peridroma margaritosa* (Haw.), caused severe damage to tomatoes in one greenhouse at Victoria, B. C. (2) An outbreak of *Peridroma margaritosa* (Haw.) occurred from Windsor to Ottawa, Ont., at the same time as the armyworm. Thus the reports by gardeners of armyworms attacking ornamentals, etc., probably should have referred to this cutworm. They caused considerable damage to tomatoes, tobacco, and to a limited degree peas for canning. They were very destructive to home garden tomatoes and flowers such as petunias and zinnias. (62) Cutworms of several species, but especially *Peridroma margaritosa* (Haw.), damaged corn during late spring and early summer. The outbreak was more widespread than in 1953, but the damage was lighter. One farmer near Wallaceburg, Ont., lost 25 percent of his stand in a 15-acre field. Control measures were applied promptly over a wide area and damage was greatly reduced as a consequence. (65) *Peridroma margaritosa* was widespread throughout southwestern Ontario on tomatoes. Generally the infestations were light but damage was reportedly severe in a few local areas. (68-69) A heavy infestation of the variegated cutworm, *Peridroma margaritosa* (Haw.), occurred in the latter half of July, damaging tobacco in the Tillsonburg, Delhi, and Simcoe areas of Ontario. Only scattered areas of a field were heavily attacked and the general distribution of infested fields was irregular. (70) The variegated cutworm ranged from Port Hope to Wallaceburg and Windsor in southwestern Ontario. "Damage to ornamentals in some areas was reportedly severe." (73) The variegated cutworm caused extensive damage to a crop of greenhouse carnations during July. (74) In July and early August, the variegated cutworm and related species caused a great deal of injury, particularly in home gardens, to almost all vegetable crops. Numerous types of ornamentals were also attacked in Ontario. (75) "Well-grown specimens of variegated cutworm, *Peridroma margaritosa* (Haw.), were found in fields and home gardens August 1 but were not immediately determined as their presence in outbreak proportions was obscured by the current armyworm outbreak." (88) The variegated cutworm appeared during August in the most sévere and widespread outbreak on record and caused considerable damage in home and market gardens in Nova Scotia. (114) In Prince Edward Island, the variegated cutworm caused some damage in gardens, but in general the population was low. (120) The variegated cutworm made its first appearance in Newfoundland in association with the outbreak of armyworms in August and September. The heaviest infestations occurred in the Codroy Valley, Cartyville, Fogo, Trinity South, and Green Bay areas. A few specimens were taken on the Avalon Peninsula. Cabbage and turnip crops were severely damaged in some areas. (124) A map showing the distribution of the variegated cutworm is given. (opp. 179) In British Columbia at Rayleigh and Spence's Bridge, the variegated cutworm damaged the fruit of tomatoes. (339)

1956. Can. Insect Pest Rev. 34.
In British Columbia, the variegated cutworm caused damage to the fruit of tomatoes in Rayleigh and Spence's Bridge. (11) Several reports of cutworm damage to gardens were received from Manitoba. Adults reared from larvae collected at Oak Bluff and Beausejour were identified as the variegated cutworm, *Peridroma margaritosa* (Haw.). (47) The variegated cutworm was responsible for damaging

asparagus spears in many fields in mid-May. Many plants in newly set fields of tomatoes were also severely attacked. Aldrin baits were used to control this insect in Ontario. (73) In Ontario the variegated cutworm was found in mid-May feeding on raspberry shoots and also was responsible for destroying a large percent of newly set strawberry plants in two different fields. Poison baits controlled this pest. (74) No damage by the variegated cutworm *Peridroma margaritosa* was noted in Ontario. (85) The variegated cutworm, *Peridroma margaritosa* (Haw.), and cutworms of the genera *Euxoa* and *Feltia* occurred in normal, moderate numbers in Nova Scotia. (116) The variegated cutworm, *Peridroma margaritosa* (Haw.), caused slight to moderate damage to vegetables in certain areas but in general the population was below normal in Prince Edward Island. (123) The bertha armyworm and the variegated cutworm occurred in moderate to severe infestations in the Kamloops and Grand Forks areas of British Columbia. At Grand Forks, damage ranged from light to severe on potato foliage and such garden vegetables as beans, beets, peas, lettuce, and tomatoes. In the Kamloops district, light damage occurred on potato foliage. Late-summer infestation and damage of this nature has not occurred at Grand Forks for several years. (248) In 1956, in southwestern Ontario the variegated cutworm was one of only three cutworms considered to be economically important. (273) The variegated cutworm, *Peridroma margaritosa* (Haw.), made its first appearance in Newfoundland where heavy infestations caused damage in the Codroy Valley, Cartyville, Fogo, Trinity South, and Green Bay areas. A few specimens were taken on the Avalon Peninsula. (293)

1957. Can. Insect Pest Rev. 35.
In British Columbia, the variegated cutworm defoliated plants in parts of one potato field in Solsqua and three potato fields in Grand Forks. It also did severe damage to the foliage of garden stands of beets, lettuce, peas, and the green fruits of tomatoes in the latter district. (13) The black cutworm, the variegated cutworm, and the dark-sided cutworm generally caused light injury in untreated fields of tobacco in the counties of Kent, Elgin, Norfolk, and Brant in Ontario. Severe injury was reported to flue-cured and burley tobacco on a few farms in the townships of Harwich, Howard, and Oxford in Kent County. A second generation of the variegated cutworm caused 10 to 15 percent injury to burley tobacco near Port Stanley. (63) Large numbers of the variegated cutworm severely injured chrysanthemum buds in a greenhouse at Falmouth, N.S., in early November. They were found in the daytime beneath the concrete benches in which the plants were grown. (105) The variegated cutworm caused some damage in gardens and commercial plantings of cucumbers and beans, but the infestation was below normal in Prince Edward Island. (113) In Newfoundland, since 1954 and 1955, only a few specimens of the variegated cutworm have been observed. (115) The variegated cutworm caused up to 10 percent injury in infested fields of tobacco in Kent County, Ont. The species was more numerous than in 1955 or 1956. (193) At Grand Forks, B.C., the variegated cutworm, *Peridroma margaritosa*, was a pest. (268) The black cutworm, *Agrotis ypsilon* Rott., and the variegated cutworm, *Peridroma margaritosa* Haw., were the principal species of economic importance in southwestern Ontario in 1957. (269)

1958. Can. Insect Pest Rev. 36.
During July the variegated cutworm, *Peridroma margaritosa* (Haw.), caused some defoliation in a few potato crops at Grand Forks, B.C. (9) It was of interest to note that minor infestations of the variegated cutworm and the spotted cutworm occurred in conjunction with armyworms in many infested fields in Ontario. (65) In Nova Scotia, the variegated cutworm was more numerous than usual this season. The damage was mainly in vegetable and flower gardens and commercial

plantings of cucumbers and beans. (117) In British Columbia, *Peridroma margaritosa* was heavily attacked by a polyhedral virus. (125) A general outbreak of the variegated cutworm, *Peridroma margaritosa* (Haw.), occurred in the lower Fraser Valley, B. C., this season. Many reports of damage were received. The last "epidemic" of this species occurred in this area in 1940. (159) A general infestation of the variegated cutworm, *Peridroma margaritosa* (Haw.), occurred at Vancouver and in the delta area of the Lower Fraser River and along the river eastward as far as Chilliwack, B. C. Severe defoliation occurred in some fields of early potatoes and sugar beet seed on Westham Island. Garden vegetables and flowers at Chilliwack, Bradner, Abbotsford, Cloverdale, and Langley were generally infested; however, severe damage was spotty. An outbreak of this magnitude has not occurred in this territory for many years. An outbreak of the variegated cutworm is general throughout the Vancouver delta and the lower Fraser Valley, with severe defoliation occurring on some crops. (191) The variegated cutworm, *Peridroma margaritosa* (Haw.), has not been prevalent to date this year on tobacco in Kent County, Ont. (192) Potato crops in Grand Forks, Chase, Lillooet, and Soda Creek districts of British Columbia were lightly damaged by the variegated cutworm and the bertha armyworm. (222) During early summer, an outbreak of the variegated cutworm occurred in the Vancouver district and in various localities in the Fraser River Valley eastward to Chilliwack, B. C. Serious damage was spotty and occurred chiefly in vegetable gardens. Most susceptible field crops appeared not to be seriously infested but severe defoliation occurred in an early potato crop and one field of sugar beet seed on Westham Island. In the Bradner district, a few commercial stands of rhubarb and raspberry were severely defoliated. There were no mid-summer outbreaks of the variegated cutworm. (281)

1959. Can. Insect Pest Rev. 37.

The variegated cutworm on Vancouver Island, B. C., was more widespread and damage to strawberry, potato, tomato, and many other crops was more severe than had ever been recorded there. (1) The most serious outbreak was that of cutworms in late June. Almost all of the larvae seen and adults reared were the variegated cutworm, *Peridroma margaritosa* (Haw.). The cutworms were widespread but unevenly distributed. Many Vancouver and North Vancouver gardens were virtually stripped and economic damage in the Ladner-Boundary Bay area was extensive. Early potato plants were skeletonized in some fields and the mature cutworms bored into and ruined the tubers of a considerable part of the crop. At first the tubers were damaged when they were dug and left in the fields overnight, but within a day or so the diggers were bringing up damaged tubers, sometimes with cutworms inside them. They were controlled by normal foliage treatment against tuber flea beetle. Four hundred acres of sugar beets grown for seed at Ladner and Westham Island were severely damaged before they were sprayed by airplane. Some rutabaga crops in the Cloverdale area were rendered unmarketable. (4, 124) During mid-summer, infestations of the variegated cutworm were light at Grand Forks and Soda Creek in British Columbia and damage in gardens and commercial potato crops was negligible. (12) Very little damage was caused by the variegated cutworm in Ontario. (66) Variegated cutworms were not generally serious pests this season, but damage was reported from isolated areas on Prince Edward Island. (114) The variegated cutworm was numerous and control measures were required in some tobacco fields in southwestern Ontario. Populations of the variegated cutworm were extremely large and damage severe in a few fields of burley tobacco in Essex County. As many as 10 larvae per foot of row fed on discarded suckers. (190) The variegated cutworm was collected at light traps at Chatham, Ontario, between Sept. 16 and Nov. 15, 1959. (237)

The variegated cutworm was one of many insects found feeding on tobacco in Ontario. (241)

1960. Can. Insect Pest Rev. 38.
In September, larvae of the variegated cutworm were found damaging cabbage in a market garden in the Prince George area, B. C. The larvae entered the cabbage from the ground side, which made control difficult and ruined the heads for market. (10) The variegated cutworm along with other species caused considerable injury to flue-cured tobacco in late June and early July in Norfolk County, Ont. Very heavy infestations of the variegated cutworm occurred in August in burley tobacco in Essex County. (54) The variegated cutworm, *Peridroma margaritosa* (Haw.), was not considered serious, although in isolated cases severe damage was reported in strawberry transplantings in Prince Edward Island. (102-103) *Peridroma margaritosa* (Haw.) moths were collected at light traps at Chatham, Ont., between April and July. (170) The variegated cutworm was collected at light traps in Chatham, Ont., between August and October. (223, 224)

1961. Can. Insect Pest Rev. 39.
Populations of the variegated cutworm, which usually attacks tobacco a few weeks after planting, were lighter than usual. (53) In Nova Scotia the variegated cutworm was present in normal numbers, especially early in the season. (99) Populations of the variegated cutworm were low in southwestern Ontario. (162) *Peridroma margaritosa* (Haw.) moths were collected at light traps at Chatham, Ont. (209, 210) The black cutworm and the variegated cutworm caused very little injury to tobacco in 1961 in southwestern Ontario. (341) The variegated cutworm, *Peridroma margaritosa* (Haw.), caused severe damage in many home gardens but was readily controlled with soil insecticides. (382)

1962. Can. Insect Pest Rev. 40.
The variegated cutworm, *Peridroma margaritosa* (Haw.), was taken at light traps at Delhi, Ont. (36, 37) The variegated cutworm, in recent years called *Peridroma margaritosa* (Haworth), has reverted to *P. saucia* (Hübner). The change appeared in the most recent list of "Common Names of Insects" whose authorities consider the North America species to be conspecific with the European; therefore it should again be called *saucia*. Small numbers of the variegated cutworm, *Peridroma saucia* Hübner, were damaging tobacco in southwestern Ontario during the first half of August. (76) Variegated cutworms were collected at Chatham, Ont., at light traps. (93) The variegated cutworm was recorded at Kamloops, B.C., in 1940. It was one of the main cutworm pests in midsummer and early fall. *Winthemia rufonata* (Bigot.), *Phryxe pecosensis* (Tsnd.), *Achaetoneura archippivora* (Will.), and *Eulophus* sp., possibly *pallipes* (Prov.), were parasites of *Peridroma saucia*. In Grand Forks and Soda Creek, several variegated cutworm larvae died because of a virus infection. (120-121) The variegated cutworm caused little injury to tobacco in 1962 in Ontario. (230) The variegated cutworm caused some damage but was not as prevalent as usual in Prince Edward Island. (264)

1963. Can. Insect Pest Rev. 41.
Reports of the variegated cutworm attacking flue-cured tobacco seedlings in greenhouses in Norfolk County, Ont., were unusually numerous in 1963. (45) In Ontario, the variegated cutworm severely attacked tobacco as seedlings in greenhouses. (89) Burley tobacco in Kent and Essex counties, Ont., was severely attacked by the variegated cutworm the first 2 weeks in August. (92) The variegated cutworm caused considerable injury in a few tobacco fields in late August. (215) The variegated cutworm was very prevalent in tomato and barley tobacco fields in Kent and Essex counties, Ont., during August. (219, 220) This

cutworm also caused injury in tobacco greenhouses in Norfolk County, Ont., in May. (220) In the Sydney area of Nova Scotia, at least two fields of lettuce and beets were severely and extensively damaged by the variegated cutworm. (238) The variegated cutworm was quite prevalent. Damage was reported mainly in flower and vegetable gardens in Prince Edward Island. (245)

1964. Can. Insect Pest Rev. 42.
The variegated cutworm, *Peridroma saucia* (Hübner), has been reported at Drumheller, Alberta, on poplar. (45) A severe and damaging cutworm infestation developed on a 70-acre stand of flue-cured tobacco at Canning, N. S. The variegated cutworm, *Peridroma saucia* (Hübner), and the black cutworm were both involved in this infestation, with the variegated cutworm slightly more numerous. (61) *Peridroma saucia* (Hüb.) moths were coming out of rock wool insulation in Ottawa, Ont. (72) In the lower Fraser Valley, B. C., the variegated cutworm, *Peridroma saucia* (Hübner), severely infested sugar beet seed crops. (75, 78) The cutworms *Peridroma saucia* (Hübner) and *Diarsia pseudorosaria* Hardwick caused severe defoliation in sugar beet seed crops at Ladner. Damage was late in the season, resulting in a slight reduction only in seed production. (164) In July, near Canning, N. S., a severe and damaging infestation of the varigated cutworm, *Peridroma saucia* (Hübner), and the black cutworm, *Agrotis ipsilon* (Hufnagel), developed on more than 70 acres of flue-cured tobacco. (212) The variegated cutworm, *Peridroma saucia* (Hübner), was more prevalent than usual. Damage was mainly in flower gardens and vegetable crops in New Brunswick. (219)

1965. Can. Insect Pest Rev. 43.
In British Columbia, the variegated cutworm, *Peridroma saucia* (Hübner), occurred in outbreak numbers in the Chilliwack and Agassiz areas. (93) A minor outbreak of cutworms, tentatively identified as the variegated cutworm, *Peridroma saucia* (Hübner), damaged gardens in the city of Vancouver and crops throughout the lower Fraser Valley. Severe losses occurred in small gardens to all garden crops where no control was attempted at Sardis, Agassiz, and Chilliwack. (97) The variegated cutworm, *Peridroma saucia* (Hübner), was in outbreak numbers at Agassiz and Chilliwack in July, severely damaging the foliage of potatoes, raspberries, beets, spinach, tomatoes, and other crops. At Ladner, B. C., it damaged sweet corn and tomatoes in August. (188) The variegated cutworm, *Peridroma saucia* (Hübner), was more prevalent in 1965 than usual. Considerable damage was observed early in July in some potato fields in Prince Edward Island. (245)

1966. Can. Insect Pest Rev. 44.
The variegated cutworm was prevalent in market and home gardens in Prince Edward Island. Several potato fields were moderately infested in July. It was very troublesome in Newfoundland during August and September, attacking cabbage, cauliflower, Brussel sprouts, tomatoes, and dahlias. In some areas, severe losses occurred in both early and late-season cabbage. (3)

1967. Can. Insect Pest Rev. 45.
The variegated cutworm caused an estimated 20 percent damage to treated cabbage in the Notre Dame bay area and the Avalon Peninsula in Newfoundland. (12)

1968. Can. Agr. Insect Pest Rev. 46.
The variegated cutworm caused a 10 percent loss in a 10-acre field of corn at Highgate, Ont. (8) An average of three larvae per square foot of the variegated cutworm damaged approximately 16 percent of tobacco in untreated plant beds in a Delhi, Ont., greenhouse. (10-11) Variegated cutworms damaged the fruits of tomatoes in various parts of Kent County, Ont. The same cutworm

caused from 1 to 20 percent loss of cabbage at St. John's and Point Lemington, Newfoundland. (12) The variegated cutworm attacked white spruce seedlings at a Fort Frances, Ont., nursery. (21)

1970. Can. Agr. Insect Pest Rev. 48.
The variegated cutworm, *Peridroma saucia* (Hübner), killed 50 percent of tomatoes in two vegetable gardens reported, one at Saskatoon and one at Rose Valley, Sask. (17) The variegated cutworm was the species destructive to potatoes in Elgin County, Ont. The variegated cutworm caused moderate to severe damage to cabbage in Lunenburg County, N. S., from July to October and was extremely troublesome, particularly on cabbage, throughout the season in Newfoundland. In some areas of Newfoundland, potatoes were defoliated by the pest. (18)

1971. Can. Agr. Insect Pest Rev. 49.
Numbers of the variegated cutworm, *Peridroma saucia* (Hübner), increased in some localized fields in late fall, particularly cabbage fields. In Lunenburg County, N. S., the variegated cutworm continued to be very numerous on late cabbage, as they have been for 3 years. They are difficult to control but do not do a great deal of damage as they do not penetrate the heads. (18)

Chamberlin, F. S. and N. Allen. 1957. Tobacco cutworms. How to control them. U. S. Dep. Agr. Leaflet 417:1-8.
The variegated cutworm is one of the more injurious species. It occurs wherever tobacco is grown. It has three or four generations a year. The larvae vary considerably in color, but they may be distinguished by a row of yellow or orange dots down the middle of the back. (3)

Chamberlin, F. S. and A. H. Madden. 1942. Insect pests of cigar-type tobaccos in southern districts. U. S. Dep. Agr. Circ. 639:1-54.
Some of the cutworms frequently assume the climbing habit and feed on the foliage of high tobacco. The variegated cutworm, *Peridroma margaritosa* (Haw.), is one of the cutworms which occasionally causes considerable damage to the crop in this region. (48)

Chittenden, F. H. 1901. Some insects injurious to the violet, rose and other ornamental plants. U. S. Dep. Agr., Div. Entomol. Bull. 27:1-114.
The distribution, appearance, life history, type of injury, and methods of control of the variegated cutworm are discussed. The egg, larvae, and moth are figured. (50-54)

Chittenden, F. H. 1901. The fall armyworm and variegated cutworm. U. S. Dep. Agr., Div. Entomol. Bull. 29:1-64.
The description, life history, distribution, food plants, and reports of injury are discussed for the variegated cutworm. The egg, larvae, and moth are figured. The great outbreak of 1900 in Oregon, British Columbia, and Washington is described. Natural enemies included *Phoracera saundersi* Will., *Archytas analis* Fab., *Inchneumon capitus* Cr., and *Scarites subterraneous* Fab.

Chittenden, F. H. 1902. Estimated loss occasioned by the variegated cutworm in 1900. U. S. Dep. Agr., Div. Entomol. Bull. 38:1-110.
The variegated cutworm caused an estimated $2.5 million cash value of crop injury in the United States in the 1900 outbreak. (91-92)

Chittenden, F. H. 1903. A brief account of the principal insect enemies of the sugar beet. U. S. Dep. Agr., Div. Entomol. Bull. 43:1-71.

There is little doubt that the most important and widely known cutworm is *Peridroma margaritosa*. It is cosmopolitan and likely to be found anywhere. It favors vegetable crops for food, but could exist on any kind of vegetation. The moth, egg, and larva of the variegated cutworm are figured. (30-31)

Chittenden, F. H. 1907. Insects injurious to vegetables. Orange Judd Co., London. 262 pp.
The variegated cutworm, *Peridroma saucia*, is the most destructive and widely known of all cutworms. It is a climbing cutworm. The egg, larva, and moth are figured. Control measures for cutworms are discussed. (53-54)

Chittenden, F. H. 1909. Some insects injurious to truck crops. The semitropical armyworm. U. S. Dep. Agr., Bur. Entomol. Bull. 66(5):53-70.
Reference is made to the variegated cutworm, *Peridroma margaritosa*, because *Prodenia eridania* is also a continuous breeder, with the larvae being present in the field throughout the long summer season in the South. (60)

Chittenden, F. H. 1913. Insects injurious to the onion crop. U. S. Dep. Agr. Yearbook, 1912:319-334.
At times the variegated cutworm, *Peridroma margaritosa*, is a very injurious species to the onion crop in the United States. (332)

Coad, B. R. and R. W. Howe. 1916. Insect injury to cotton seedlings. J. Agr. Res., 6(3):129-139.
Peridroma margaritosa as well as *Prodenia ornithogalli* and *Estigmene acraea* damaged cotton seedlings at Tallulah, La. (139)

Cockerell, T. D. A. 1915. Sunflower insects. Can. Entomol., 47:280-292.
"A cutworm from a sunflower head, collected at Boulder, Colo., August 16, gave a moth Oct. 4. It was the widely distributed *Lycophotia margaritosa* Haw. (*saucia* Hbn.)." (282)

Compton, C. C. 1932. Insects feeding on truck and garden crops and how to control them. Ill. Agr. Exp. Sta. Circ. 391:1-48.
Character of injury, life history, habits, and control methods for cutworms are discussed. The variegated cutworm was a serious pest of truck and garden crops in Illinois. The moth, larva, and eggs of *Lycophotia margaritosa saucia* (Hbn.) are figured. (10-11)

Cook, A. J. 1912. Cutworms. Calif. Comm. Hort. Mon. Bull., 1(7):271-274.
The variegated cutworm was present in outbreak numbers in 1912, causing much destruction in northern and central California. The life history, natural enemies, and artificial remedies of the variegated cutworm are discussed. The pupa and larva are figured.

Cook, A. J. 1914. Alfalfa. Mon. Bull. State Comm. Hort. Calif., 3(2):53-73.
In a lengthy article on the cultivation of alfalfa, the author notes among the pests of this crop in California the following insects: "Armyworm" (*Peridroma margaritosa* var. *saucia*). The variegated cutworm was sometimes called the armyworm because it occurs in such vast numbers. (68)

Cook, W. C. 1920. Cutworms and armyworms. Office State Entomol. Minn. Circ. 52: 1-8.
"The Variegated Cutworm.---This species and the armyworm have similar life histories and often work together, so the following sketch will do for both. They hibernate as partly grown cutworms, coming out in the spring as soon as

the frost is out of the ground. At this time of year they will eat anything, and they have been known to climb trees and devour the opening buds. During the latter part of May they work in gardens, attacking any and all plants. About June 1, they enter the soil and change to reddish grown pupae, coming out about July 1 as moths. The variegated cutworm lays its eggs in masses on the side of leaves, generally choosing peas, beans, or clover, while the armyworm prefers grass. The former may lay as high as 2,000 eggs, the latter about 500. The young larvae hatching from these eggs feed during July, and about August 1 become full grown and pupate. In late July they assume the armyworm habit when abundant, and may do immense damage in a few days. The moths from this generation lay eggs in September from which come the overwintering larvae. Fields infested with them should be plowed as near Sept. 1 as possible, forcing the moths to lay their eggs elsewhere." (5)

Cook, W. C. 1923. Studies in the physical ecology of the Noctuidae. Minn. Agr. Exp. Sta. Tech. Bull. 12:1-37.
A general consideration of the studies presented in this paper leads to the following conclusions:

1. Each of the species included in this study has a very definite optimum soil moisture requirement, which, broadly speaking, limits the distribution of the species.

2. This requirement may be determined experimentally under controlled conditions, and also indirectly, by a statistical analysis of the weather conditions surrounding outbreaks of that species.

3. In each case, the optimum moisture requirement of the species which occur in any given region is a close approach to the normal climatic condition in that region, so that outbreaks would occur every season were it not that there is also a necessary seasonal sequence of conditions which must be fulfilled in order to enable the insect to reach destructive abundance.

4. This sequence, which may operate either by favoring the destructive insect, by limiting the activities of its enemies, or both, is the controlling factor in the production of outbreaks, and a careful study of such a sequence in the life history of any insect should permit prediction of the possibility of an outbreak of that insect in any given region.

In conclusion, the author emphasized the importance of the use of mathematical methods in the study of insect outbreaks, as well as to show its practical application in the examples cited. As the literature of statistics is rather foreign to entomological workers, a few selected titles of especially valuable works, which are of great service in such a study, are listed in the bibliography. (36-37)

Cook, W. C. 1934. Cutworms and armyworms. Minn. Agr. Exp. Sta. Ext. Circ. 48:1-8.
The life history of the variegated cutworm, *Lycophotia margaritosa*, is discussed. The moth and the larva are figured. (4)

Cooley, R. A. 1906. Preliminary report on sugar beet insect pests. Annu. Rep. Mont. Agr. Coll. Exp. Sta. 12:234-292.
Of all the various cutworms, the variegated cutworm is perhaps the most destructive. It occurs throughout Europe and the United States. It cuts plants off at or just below the surface of the ground. The moth, larva, and egg are figured. (267)

Coquillett, D. W. 1897. Revision of the Tachinidae of America north of Mexico. A family of parasitic two-winged insects. U. S. Dep. Agr., Div. Entomol. Tech. Ser. 7:1-156.
Parasites bred from *Peridroma saucia* larvae were identified as *Chaetogaedia monticola* Bigot., *Gonia capitata* DeG., and *Winthemia 4-Pustulata* Fabr. (26)

Cortes, P. R., et al. 1972. Las "cuncunillas" (Noctuidae) de la alfalfa en lluta y camarones Arica-Chile. - Un problema bio-ecologica de control (Resumen). Revista Peruana de Entomol. Agr. 15(2):253-266.
The variegated cutworm is listed as a species frequently associated with alfalfa in Arica, Peru. (256)

Coudriet, D. L. 1970. Rearing the orange tortrix on a synthetic diet. J. Econ. Entomol. 63(3):1004-1005.
Along with rearing the orange tortrix on a synthetic diet, it was shown that the larvae of the variegated cutworm, *Peridroma saucia*, produced normal appearing adults when they were reared on diet 4.

Cretschmar, M. 1955. Häufiges Auftreten von *Agrotis ipsilon* Hfn. und *Peridroma saucia* Hb. im Herbst 1954. Zeit. fur. Lepidopterologie. 3:142.
An effort was made to collect *Peridroma saucia* and *Agrotis ipsilon* in the vicinity near Bodendorf, Germany, in the fall of 1954. Only a few specimens were collected on Oct. 16, 17, 19, 21, and 24. *P. saucia* appeared to be fresh and therefore it was assumed they do not migrate as does *A. ipsilon*.

Cristobal, U. L. 1947. Dos nuevos himenopteros utiles. Revista de Investigaciones Agrícolas. 1(4):279-282.
The hosts of the hymenopteran parasite, *Ameloctonus rubraniger* Cristobal, in Argentina were *Pulsia nú Guenée, Thyreion gelotopoen* Dyar, and *Lycophotia margaritosa* Haworth.

Crowell, H. H. 1974. Variegated cutworm situation. Proc. Oregon Hort. Soc. Annu. Rep., 65:228-230.
"The variegated cutworm, *Peridroma saucia*, is the most serious cutworm species in the production of vegetable crops in the Willamette Valley." (Oregon) (230)
The article deals with the cutworm problem and methods of control over the years. Candidate substitutes for DDT were Lannate, Dylox, Sevin, Dyfonate, Gardona, and Thuricide.

Crumb, S. E. 1915. A key to the cutworms affecting tobacco. J. Econ. Entomol. 8:392-396.
This key includes only the cutworms known to affect tobacco in the United States. The majority of the common species, including *Peridroma saucia*, also affect other crops.

Crumb, S. E. 1926. Tobacco cutworms and their control. U. S. Dep. Agr. Farmers' Bull. 1494:1-14.
"This variegated cutworm (Fig. 3) occurs in injurious numbers wherever tobacco is grown, and has probably caused as much damage as any other cutworm in the United States. In Tennessee it is one of the common species injurious to tobacco in fields, but is especially injurious to plant beds. There are four generations during the year in Tennessee, and the winter is passed as a pupa. "Moths begin to emerge very early in the season and the destructive spring activity of the larva is over in Tennessee by the latter part of May. In Kentucky and Illinois, larvae remain active in destructive numbers until early in June. The main fall flight of moths occurs in August, September, and October.

"This cutworm varies considerably in color, but it may always be distinguished by the presence of a row of yellow or orange dots down the middle line of the back, at least on the fore part of the body." (2-3)

Crumb, S. E. 1927. The armyworms (Lep. Noctuidae). Bull. Brooklyn Entomol. Soc. 22(1):41-55.
The full grown larva, distribution, and food plants of the variegated cutworm, *Lycophotia margaritosa*, are discussed briefly. The larva is a very general feeder on field and garden crops, foliage and fruit of trees and vines, and various plants in greenhouses and cold frames. (48-49)

Crumb, S. E. 1929. Tobacco cutworms. U. S. Dep. Agr. Tech. Bull. 88:1-176.
This is a very complete account of cutworms, including *Lycophotia saucia* Hbn., which attack tobacco. It includes larval and pupal anatomy and keys to species for eggs, larvae, and pupae. Distribution, hosts, seasonal history, and description of stages are given for important species. Control measures include natural (such as pathogens and predators), chemical, and cultural. (107-115)

Crumb, S. E. 1932. The more important climbing cutworms. Bull. Brooklyn Entomol. Soc. 27:73-100.
The full grown larva of the variegated cutworm, *Lycophotia saucia*, is discussed. This cutworm is distributed over the United States and Canada. It feeds on apple, apricot, blackberry, box elder, cedar, cherry, currant, gooseberry, grape, honey locust, lemon, maple, mulberry, orange, osage orange, peach, plum, prune, raspberry, sumac, willow, and a great variety of herbaceous plants. (85)

Crumb, S. E. 1956. The larvae of the Phalaenidae. U. S. Dep. Agr. Tech. Bull. 1135:1-356.
The larva of the variegated cutworm, *Peridroma margaritosa* form *saucia*, is described. The distribution and food plants are discussed briefly. (95)

Davidson, R. H. 1966. Insect pests of farm, garden and orchard. 6th Ed., John Wiley and Sons, Inc., New York. 675 pp.
Some of the better known cutworms are the following: the black cutworm, the dingy cutworm, the clay-backed cutworm, the granulate cutworm, the bronzed cutworm, the variegated cutworm, the spotted cutworm, the army cutworm, the pale western cutworm, the glassy cutworm, the bristly cutworm, the red-backed cutworm, the dark-sided cutworm, the striped cutworm, and the black army cutworm. (151)

Davis, G. C. 1896. Part I. Climbing cutworms. Mich. Agr. Exp. Sta. 132:1-14.
The variegated cutworm, *Peridroma saucia*, is one of the climbing cutworms. The egg, larva, and moth of the variegated cutworm are figured. (9)

Davis, J. J. 1910. Insect notes from Illinois for 1909. J. Econ. Entomol. 3: 180-182.
"Greenhouse lettuce was badly attacked by the variegated cutworm, *Peridroma saucia* Hbn. (181) The variegated cutworm, *Peridroma saucia* Hbn., was found damaging greenhouse carnations, *Similax* and *Asparagus plumosa*. It is especially fond of the tender young asparagus shoots. Our experiments showed the poisoned bran mixture together with the trap lantern a very satisfactory remedy. Hand picking was useless in the asparagus houses." (182)

Davis, J. J. 1911. Cutworms. Trans., Ill. State Hort. Soc. for 1910:36-37.
The most serious enemy of hothouse lettuce is the common cutworm, *Peridroma*

saucia. This insect is probably even more troublesome to the florist, for it is one of the worst general pests with which he has to deal. The appearance, habits, and control methods for the variegated cutworm are discussed.

Davis, J. J. 1911. On the more important insects of the truck-farm and vegetable garden. 26th Rep. State Entomol. on Noxious and Beneficial Insects of Ill.: 1-160.
Cutworms are sometimes very injurious to cabbage, cutting off the young plants and killing them outright. Remedies are discussed briefly. (107)

Davis, J. J. 1912. Report on insects injurious to flowering and ornamental greenhouse plants in Illinois. 27th Rep. State Entomol. on Noxious and Beneficial Insects of Ill.:1-140
A brief life history is given for the variegated cutworm, *Peridroma margaritosa*. The moth, larva, and egg are figured. Methods for controlling cutworms are discussed. (84-86)

Davis, J. J. 1928. Insects of Indiana for 1927. Proc. Ind. Acad. Sci., 37:445-460.
"The variegated cutworm (*Peridroma margaritosa* Haw.) was common in many greenhouses. Especially noticeable was injury in late April and early May in a greenhouse at Indianapolis where they defoliated tomato plants and caused heavy loss by eating in heads of greenhouse cauliflower. Cutworms (probably *Euxoa* spp.) were generally troublesome in northern Indiana in gardens during May and early June." (452)

Davis, J. J. 1955. Insects of Indiana in 1954. Proc. Ind. Acad. Sci., 64:121-126.
"The variegated cutworm (*Peridroma margaritosa*) appeared in unprecedented numbers, especially in southern Indiana, occurring the last half of May and into June. They were especially abundant on alfalfa and because of their climbing habit they were frequently mistaken for armyworms. By early June they were migrating into and damaging various adjoining crops. I do not recall this cutworm so abundant on field crops during the past 40 years. During the latter part of August this cutworm was a serious pest eating into tomatoes." (122)

Dean, G. A. 1915. Further data on poisoned bran mash flavoured with fruit juice as a means of controlling some insects. J. Econ. Entomol. 8(2):219-227.
"It is nothing unusual in Kansas for the variegated cutworm (*Peridroma saucia*) to appear in great numbers in local districts and take on the habits of the armyworm. In the spring of 1909 the infestation of this insect, which was more severe than usual, extended over several counties in the south central part of the state. At that time they appeared in the early spring and destroyed thousands of acres of wheat and many acres of alfalfa. The writer as well as two other men of the experiment station spent several days in the field endeavoring to find an effective method of control. The ordinary poisoned bran mash did not prove effective and was soon discarded as an ineffective and impracticable method of control.

"The infestation of last spring was a much wider one, extending over almost the same territory as that infested by the armyworm. In fact, in many cases the armyworms were associated with the cutworms in the alfalfa fields. Instead of injuring crops early in the season and confining their attack almost entirely to wheat as they did in the previous infestations, they appeared almost 60 days later or about the first of June, and the main injury was confined to the alfalfa although in a few cases after the alfalfa had been cut, they migrated into garden truck and corn."

Effective control was secured by broadcasting Paris green bait using bran mash flavored with oranges or lemons. (223-224)

Dean, G. A. 1916. Insects injurious to alfalfa. Kans. State Bd. Agr. Rep. 35: 367-400.
The appearance of the caterpillar, the habits, life history, and methods of control of the variegated cutworm are discussed. The egg, larva, and moth are figured. The outbreaks of 1909 and 1915 in Kansas are described.

Dean, G. A. 1916. Insects injurious to alfalfa. Kans. State Agr. Coll. Ext. Bull. 5:1-36.
This is a reprint of the preceding article.

Dean, G. A. and R. C. Smith. 1935. Insects injurious to alfalfa in Kansas. Kans. Bd. Agr. Bien. Rep. 29:202-249.
The life history and methods of control of the variegated cutworm are discussed. The egg, larva, and moth are figured. (224-225)

de Garay, A. D. 1944. Algunos datos sobre los "gusanos cortadores." Fitófilo, 3(3):53-55.
Three species of cutworms ("gusanos cortadores") are occasionally of major economic importance on corn in several localities in Mexico. These are the variegated cutworm, *Lycophotia margaritosa* (Haw.), the western striped armyworm, *Prodenia praefica* (Grote), and *Cea cirphidia* (Hamp.). Instructions are given for preparing an arsenically poisoned bait using bran and lemon or orange juice.

DeSilva, M. D. 1964. A note on the cutworm pests of potato in Ceylon. Trop. Agr. & Mag. [Peradeniya] 118(2):86-87.
Peridroma saucia was one of the cutworms responsible for extensive damage to potatoes in Ceylon. (86)

Dickinson, B. A., C. M. Meadows, and E. D. Witman. 1941. Sulfur as a stomach insecticide. J. Econ. Entomol. 34(5):656-659.
"Elemental sulfur is well known as a fungicide and as a contact insecticide and fumigant. The authors present in this paper results of insecticidal tests as indications that sulfur may also have limited use as a stomach poison." (656)
The variegated cutworm, *Lycophotia margaritosa saucia*, was noticeably affected by sulfur ingestion. (657)

Dirks, C. A. 1937. Biological studies of Maine moths by light trap methods. Maine Agr. Exp. Sta. Bull. 389:1-162.
No cutworm in the United States is considered to be more destructive than the variegated cutworm. The reported food plants listed by Crumb number more than 60. *L. margaritosa* is one of the most common cutworms in gardens and also in greenhouses. At irregular intervals great outbreaks occur in the United States. The range of this almost cosmopolitan insect includes the entire North American continent as well as many other parts of the world. (82)

Doane, R. W. and D. A. Brodie. 1901. The variegated cutworm. Wash. Agr. Exp. Sta. Bull. 47:1-16.
"As a result of a very unusual outbreak of cutworms, the farmers, orchardists, and gardeners of western Washington suffered a very considerable loss during the summer of 1900. The worms attacked and destroyed almost all kinds of vegetation. These cutworms proved to be the larvae of *Peridroma saucia* Hübner, an insect known over nearly the whole world which has at various times done considerable damage to various crops. A number of parasites were found infesting

the larvae. These, with a bacterial disease which was quite prevalent late in the summer, very materially lessened the number of larvae. The methods used in combating cutworms vary according to time, place, and local conditions. No single remedy can be given which will prove equally successful at all times and places." (16)

Dodge, B. O. and H. W. Rickett. 1943. Diseases and pests of ornamental plants. Jaques Cattell Press, Lancaster, Pa. 638 pp.
"Cutworms are the larvae of moths such as *Lycophotia saucia* and *Agrotis ypsilon*." (69)

Dorman, C. 1941. Zoology and entomology; control of insect pests. Annu. Rep. Miss. Agr. Exp. Sta. 54:33-34.
"The variegated cutworm is often a very important pest in Mississippi, especially in the Delta on cotton following winter cover crops. During the past spring, a few small worms were found in the Delta on April 15. By April 29 the worms were numerous in clover seed patches. These observations along with others in previous years indicate that early turning of winter cover crops will largely eliminate damage to cotton by this species, except damage due to migration from seed patches."

Dorman, C. 1941. A year of research in Mississippi farm problems. Miss. Farm Res. 411:3.
The variegated cutworm is often a very important pest in Mississippi, especially in the Delta on cotton following winter cover crops. Observations made in 1941 indicate that early turning of winter cover crops will largely eliminate damage to cotton except damage due to migration from seed patches.

Doten, S. B. 1916. Dept. of Entomology, Annu. Rep. of Bd. of Control for Fiscal Year Ending June 30, 1915. Univ. Nev. Agr. Exp. Sta.:1-56.
The variegated cutworm, *Peridroma margaritosa*, was one of the cutworms causing losses to the alfalfa crop in Nevada. It was found in midsummer injuring the second crop. Experiments in cutworm resistance to drowning are described. (35-37)

Doten, S. B. 1917. Dept. of Entomology, Annu. Rep. of Bd. of Control for Fiscal Year Ending June 30, 1916. Univ. Nev. Agr. Exp. Sta.:1-56.
Peridroma margaritosa was one of the most injurious cutworms to alfalfa. (45)

Drake, C. J. and H. M. Harris. 1927. The control of armyworms and cutworms. Iowa State Agr. Exp. Sta. Circ. 101:1-8.
A description, habits, and life cycle of cutworms in general are given. The larva, pupa, and moth of the variegated cutworm are figured.

Dury, C. 1878. Catalog of the Lepidoptera observed in the vicinity of Cincinnati, Ohio. J. Cin. Soc. Nat. Hist., 1(1):12-23.
Variegated cutworms (*Peridroma saucia*) were reported to be common in the Cincinnati area.

Dyar, H. G. 1904. The lepidoptera of the Kootenai District of Columbia. Proc. U.S. Nat. Mus. 27:779-938.
"*Peridroma margaritosa* Haworth. Fifteen specimens, June 2, 4, 11, 13, 16, 25, 30, July 8, August 7, 11, 17. The species was rare, but Mr. Cockle says it was a perfect pest the year previous, and thousands of egg masses could be seen. He attributes the scarcity of the species in 1903 to the destruction of the hatching larvae by early rains. Eggs were obtained and a brood of the larvae raised exhibiting the usual well-known characters." (824)

Eastham, J. W. and M. H. Ruhmann. 1916. Diseases and pests of cultivated plants. British Columbia Dep. Agr. Bull. 68:57-58.
"The variegated cutworm (*Peridroma saucia*) is one of the most destructive the growers of the Province have to contend with. It is a most cosmopolitan feeder, almost any kind of vegetation being acceptable. Field crops, truck crops, and fruit trees suffer to a considerable extent every year. In a late spring, when little vegetation is available, they will attack young fruit trees, eating not only the buds, but also stripping the bark off the tender branches. The life history is not well known, but undoubtedly two broods occur in British Columbia, the first brood being most prominent during April and early May, the second during the month of August. The adult is a night-flying moth. The winter is passed in the larval, pupal, and adult stages in the ground." Control measures are discussed briefly. The egg, larva, and moth are figured.

Eastham, J. W. and M. H. Ruhmann. 1927. Diseases and pests of cultivated plants. British Columbia Dep. Agr. Bull. 68:88 89.
Identical to the article by the same authors published in 1916 in B. C. Dep. Agr. Bull. 68.

Ebeling, W. 1959. Subtropical fruit pests. Univ. Calif. Div. Agr. Sci. 436 pp.
A key to the subtropical fruit pests is found in the beginning of this article. *Peridroma margaritosa* is included in this key. "The variegated cutworm, *Peridroma margaritosa* (Haworth), is one of the sporadic pests which occasionally attack young avocado trees, particularly near uncultivated areas. The adults are grayish-brown moths with dark-mottled forewings and a wing expanse of 4 to 5 cm. This is one of the night-flying noctuid moths ("millers" commonly attracted to lights. The fully grown larvae are about 4 cm. long, variable in color but usually gray or brown, mottled above with gray or darker lines and often with oblique gray areas on the sides. They feed on all kinds of vegetation. They may be controlled with commercially prepared poison baits. The bait should be scattered under the trees at dusk as the larvae emerge from the soil at night to feed." (309) *Peridroma margaritosa* (Haworth) is one of the cutworms responsible for damage to grape buds. (335)

Ebeling, W. and R. J. Pence. 1953. Avocado pests. Calif. Agr. Exp. Sta. Circ. 428: 26.
Among the pests which occasionally attack young avocado trees, particularly near large, uncultivated areas, is the variegated cutworm, *Peridroma margaritosa* (Haworth). The adults are grayish brown moths with dark mottled forewings and a wing expanse of 1-1/2 to 2 inches. This is one of the night flying moths commonly attracted to lights. The fully grown larvae are about 1-1/2 inches long, variable in color, but usually gray or brown, mottled above the gray or darker lines, and often with oblique gray areas on the sides. They feed on all kinds of vegetation. They may be controlled with commercially prepared poison baits. The bait should be scattered about under the trees just before dusk.

Elías, B. L. A., R. R. Yépiz, and C. A. Ortega. 1966. Efectividad del dieldrin aplicado a la semilla del algodonero para prevenir el daño de gusanos trozadores. (The effectiveness of dieldrin applied to cotton seed to prevent damage by cutworms.) Agricultura Tecnica, 11(6):258-261.
The variegated cutworm was reported as a pest of cotton in Mexico. Dieldrin at the rate of 330 grams per 25 kilograms of cotton seed gave good protection from the black cutworm, the variegated cutworm, and the fall armyworm.

Enns, W. R. 1951. Cotton insects and their control in Missouri. Mo. Agr. Exp. Sta. Bull. 545:1-15.

The variegated cutworm is one of the insect pests of cotton in Missouri. Control measures recommended were a 20% toxaphene dust at 10 to 15 lb. per acre or a toxaphene emulsion applied at the rate of 2 to 3 lb. of technical toxicant per acre. (6-7)

Essig, E. O. 1913. Injurious and beneficial insects of California. Calif. Comm. Hort. Mon. Bull. 2 (1-2):165-166.
The general appearance, life history, distribution, and food plants of the variegated cutworm, *Peridroma margaritosa* var. *saucia* Hbn., are discussed. The larva and moth are figured.

Essig, E. O. 1926. Insects of Western North America. Macmillan Co., N. Y. 1035 pp.
The variegated cutworm, *Lycophotia margaritosa*, is perhaps the most widely known and important cutworm, being cosmopolitan in distribution and a pest in many countries. It is very common throughout the entire West. The eggs, larvae, and moths are described briefly. (683)

Essig, E. O. 1958. Insects and mites of western North America. 2nd. Ed., Macmillan Co., N. Y. 1050 pp.
"The variegated cutworm, *Lycophotia margaritosa* (Haworth) (Figs. 556,A; 557, 558), is a grayish brown moth with dark mottled forewings, a brassy lustre, and a wing expanse of 40-50 mm. The eggs are very small, flattened, spherical, white to dull lead color, distinctly and minutely ribbed. They are laid in rows in large irregular masses on the foliage and stems of plants, the limbs and trunks of trees, and other convenient places in the early spring. The caterpillars are general and destructive feeders on all kinds of vegetation and can be serious pests to forage, cereal and truck crops, flowers, fruit, shade, ornamental, and forest trees. When mature they are 40-45 mm. long, variable in color but usually gray or brown, mottled above with gray or darker lines, and often with oblique gray areas on the sides. This is perhaps the most widely known and important cutworm, being cosmopolitan in distribution and a pest in many countries. It is very common throughout the entire West. The fungus, *Empusa aulicae* (Reichardt), kills the larvae in many localities in the spring." (683)

Felt, E. P. 1899. Cutworms on carnations. Country Gentleman, May 11, p. 368.
In 1899 the variegated cutworm, *Peridroma saucia* Hübn., attacked carnations. This case was unusually severe because not only were the leaves eaten but the buds had been excavated. A bran mash was used to bring the cutworm under control.

Felt, E. P. 1915. Twenty-ninth report of the state entomologist on injurious and other insects of the state of New York. 1913. N. Y. State Mus. Bull. 175(589): 1-257.
From Rochester, *Lycophotia margaritosa* (*Agrotis saucia*), the variegated cutworm, was reported to be feeding on clover and fallen apples. Although this cutworm is a climbing species, there was no evidence to show it had ascended the trees and attacked the fruit. (56)

Fenton, F. A. 1938. The insect record for Oklahoma, 1937. The more important insect pests. Proc. Okla. Acad. Sci., 18:38-43.
"The variegated cutworm, *Lycophotia margaritosa saucia* Hbn., occurred in large numbers at the same time the armyworm was prevalent. It was found chiefly in alfalfa fields and caused considerable damage by migrating to cotton. It was also commonly found on a number of weeds." (39)

Fenton, F. A. 1951. Insect control in legumes. Challenging problems of new agriculture are being solved. Southern Seedsman, 14(2):1-71.

The variegated cutworm can be easily controlled by scattering poisoned bran mash. Poisons commonly used were Paris green, white arsenic, and sodium fluosilicate. Cutworms and armyworms can also be controlled by treating the crop with a toxaphene spray. (20)

Fenton, F. A. 1952. Field crop insects. MacMillan Co., N. Y. 405 pp.
The variegated cutworm, *Peridroma margaritosa* (Haw.), is one of the most common and most injurious species of cutworms. It occurs both in North and South America as well as in the West Indies, Europe, northern Africa, southeastern Asia, and Hawaii. The larva and moth are figured. (185-186)

Ferguson, D. C. 1954. The Lepidoptera of Nova Scotia. Proc. Nova Scotian Inst. Sci. 23(3):1-375.
"1496 *P. margaritosa* Haw. Generally distributed and always one of the most abundant moths at bait, including form *saucia* Hbn. Throughout the season from April to November, but most plentiful in the fall. Bred August 25 from a larva which fed on grass." (227)

Ficht, G. A. 1940. Notes on Indiana Noctuidae. Proc. Ind. Acad. Sci. 49:243-253.
"*L. margaritosa* Haw. (1490). Variegated cutworm. Common from June to October. One of the most numerous and destructive cutworms. Var. *saucia* Hbn. Occurs at the same time as the typical form." (245)

Finney, G. L. 1964. The rearing of the variegated cutworm, *Peridroma saucia*, in the laboratory. J. Econ. Entomol. 57(5):788-790.
In 1955 the variegated cutworm, *Peridroma saucia* (Hübner), was selected as the laboratory host for the culture of the eulophid wasp, *Euplectrus plathypenae* Howard, an ectoparasitic species brought from Texas to California for possible control of the western yellow-striped armyworm, *Prodenia praefica* Grote, and other phalaenids. *Peridroma saucia* was favored for the following reasons. It is not subject to diapause. The larvae are highly resistant to disease when provided with fresh food and optimum environment. They are polyphagous and quite amenable to laboratory techniques. (788-789)

Fletcher, D. S. 1963. Macrolepidoptera collected by the Gough Island Scientific Survey 1955-56. Proc. Roy. Entomol. Soc. Lond., Ser. B. Taxonomy, 32(1-2):17-19.
Peridroma porphyrea (Schiffermüller) (=*Peridroma saucia*) was collected at the Gough Island Base Camp at light from October 1955 to April 1956. Gough Island is situated in the middle of the south Atlantic Ocean at about 42° south latitude. Its distribution is listed as America, Canada to Patagonia; Tristan da Cunha; Madeira; Canary Islands; N. Africa; Europe; W. Asia; N. India; Hawaii. (17)

Fletcher, J. 1900. Report of the Dominion entomologist, Central Experimental Farm, Can. Dep. Agr.:189.
Meteorus vulgaris Cresson was identified as a hymenopterous parasite of *Peridroma saucia* Hbn.

Fletcher, J. 1901. Injurious insects in Ontario during 1900. 31st Annu. Rep. Entomol. Soc. Ont. 1900:1-128.
Peridroma saucia and *Noctua c-nigrum*. These were the two devastating cutworms of the year, the former throughout the Province of British Columbia and the latter in Central Ontario. Beautifully inflated larvae in the last two or three stages were exhibited with the moths. The variegated cutworm was quite common in the area, attacking all garden plants and also doing harm in orchards on apple trees.

Fletcher, J. 1901. Report of the entomologist and botanist. Can. Exp. Farms Rep. for 1900:195-249.
The larva, pupa, and moth of the variegated cutworm are figured. "One of the most remarkable outbreaks of an injurious insect which has ever been recorded in Canada occurred last summer on the Pacific Coast, extending from Oregon through Washington and in every part of British Columbia from which reports have been received. The loss in all garden crops was enormous and was due to attacks of the caterpillar of one of the noctuid or 'owlet moths' (*Peridroma saucia* Hbn.), which has been named somewhat inappropriately the variegated cutworm." (215) A description, parasites and predators of the variegated cutworm are discussed.

Fletcher, J. 1902. Entomological record, 1901. 32nd Annu. Rep. Entomol. Soc. Ont. 1901:1-132.
"*Eupsephopaectes procinctus* Grt. This fine noctuid (two or three specimens) was taken at 'sugar' at Brandon, Man., by Mr. Hanham. Several specimens were bred by Messrs. T. Wilson and A. Bush from troublesome cutworms feeding on vegetables in gardens at Vancouver, B.C., in company with *Peridroma saucia* in 1900." (104)

Fletcher, J. 1902. Report of the entomologist and botanist. Annu. Rep. Exp. Farms Can.:197-262.
"The Variegated Cutworm (*Peridroma saucia* Hbn.). Notwithstanding the plague of this insect on the Pacific Coast last year, there was practically no recurrence of the trouble in 1901. In two instances only was damage to garden crops reported." (229)

Fletcher, J. 1905. Entomological record, 1904. 35th Annu. Rep. Entomol. Soc. Ont.: 78.
"*Gonia capitata*, DeG. Vancouver, uncommon, May 14 (Harvey). Vernon (Venables). Dr. J. B. Smith gives this as a parasite of *Peridroma saucia*."

Flock, R. A. 1946. Vegetables. Rep. State Entomol. of Arizona for 1945 and 1946:2, 16-18.
"Cutworms were widespread and destructive. *Prodenia* sp. and *Lycophotia* sp. also were taken on celery. *Lycophotia* and *Feltia* sp. were common." (18)

Forbes, S. A. 1890. Notes on cutworms. Sixteenth Rep. State Entomol. Ill.:84-97.
The larva of the variegated cutworm is described. This cutworm may be most easily recognized by the sooty brown color, finely mottled with gray, the black slightly darker than the sides, with a small yellow spot on the middle of each of several central segments and a dark patch on the segment before the last. (94)

Forbes, S. A. 1904. The more important insect injuries to Indian corn. Univ. Ill. Agr. Exp. Sta. Bull. 95:331-399.
The variegated cutworm, *Peridroma saucia*, when fully grown is about an inch and three-quarters long and is easily recognized by its conspicuous markings. The appearance, food plants, distribution, habits, and seasonal history of the variegated cutworm are discussed. (353-355)

Forbes, S. A. 1905. The more important insect injuries to Indian corn. 23rd. Rep. State Entomol. on Noxious and Beneficial Insects of Ill.:1-273.
This report is identical to the previous citation (Forbes 1904).

Forbes, S. A. 1905. A monograph of insect injuries to Indian corn. Part II. 23rd Rep. State Entomol. on Noxious and Beneficial Insects of Ill.:1-273.
This publication is the same as the one by Forbes for 1904 in Univ. Ill. Agr. Exp. Sta. Bull. 95.

Forbes, W. T. M. 1954. Lepidoptera of New York and the neighboring states, Part III Noctuidae. Cornell Univ. Agr. Exp. Sta. Mem. 329:1-433.
This publication presents keys to the subfamilies, genera, and species of noctuid moths, including *Peridroma saucia*. A brief description is given of the larva and geographical distribution. A complete description of the adult stage is presented. (51-52)

Fowler, C. 1902. Some insects of the year 1899-1900. Calif. Agr. Exp. Sta. Rep. for 1898-1901:1-144.
Occasionally the variegated cutworm occurs in great numbers. There were reports of damage to garden crops such as onions, peas, potatoes, and beets in Mendocino and Humboldt counties, California. (76)

Fox, C. J. S. and G. M. Stirrett. 1953. Annotated catalogue of insect and other invertebrate pests of tobacco in Canada. 83rd Annu. Rep. Entomol. Soc. Ont. 1952:1-105.
Peridroma margaritosa (Haw.) was nearly always present and injurious in the tobacco growing areas of Essex, Kent, Elgin, Norfolk, Brant, Oxford, l'Assomption, Montcalm, Berthier, Joliette, and Rouville counties. (52)

Freeman, G. F. 1914. Alfalfa in the southwest. Univ. Ariz. Agr. Exp. Sta. Bull. 73:233-320.
Variegated cutworm (*Peridroma margaritosa saucia*): An outbreak of the variegated cutworm in the Salt River and Buckeye Valleys, Arizona, was reported by Morrill in the spring of 1911. (302)

French, G. H. 1878. Insects injurious to the vegetable garden. Trans. Ill. State Hort. Soc., 2:179-204.
The larva, chrysalis, and moth of the variegated cutworm are described. (192-194)

French, G. H. 1878. Cutworms. 7th Annu. Rep. Ill. State Entomol.:135-268.
Agrotis saucia. Hbn. (the unarmed rustic) is the variegated cutworm. This species is the *Agrotis inermis* of Harris and the *Agrotis ortonii* of Packard. It is widely distributed and it is probable that no other species is a more general feeder. This report describes the characters, habits, ravages, and remedies for cutworms, including *Agrotis saucia*. (211-213)

French, G. H. 1878. Moths - Lepidoptera. Ill. State Entomol. Annu. Rep. 7:79-106.
The larva, moth, food habits, life history, and distribution of the variegated cutworm are discussed. (94-95)

Frost, S. W. 1955. Cutworms of Pennsylvania. Penn. State Agr. Exp. Sta. Bull. 596:1-29.
The variegated cutworm is a typical climbing species but often feeds at the surface of the soil. The larva and moth are figured. (16)

Fulton, H. R., W. J. Wright, and J. W. Gregg. 1911. The control of insects and diseases affecting horticultural crops. Penn. State Agr. Exp. Sta. Bull. 110: 1-44.
"Variegated cutworm (*Peridroma saucia*). The most destructive and widely known of all cutworms attacking garden plants, cutting the young bean plants off at the surface of the ground. Control: Poison baits are most successful. Spray a patch of clover with Paris green or arsenate of lead and sprinkle the clover along the rows of cultivated plants. Bran mash bait, made of molasses, bran, Paris green, or white arsenic mixed to a paste and placed along the rows, is still an efficacious remedy." (20)

Fyles, T. W. 1897. Lepidopterous pests of the meadow and the lawn. 27th Annu. Rep. Entomol. Soc. Ont. 1896:1-127.
Among the cutworms, one particularly marked as injurious to the hay crop is *Peridroma saucia* (Hübner). There are usually two broods in a year. These cutworms strip clover, cut off heads of timothy, and sometimes even devour roots of grasses. (100)

Gabriel, B. P. 1959. Fungus infection of insects via the alimentary tract. J. Ins. Path. 1:319-330.
"Germination of conidia of *Beauveria bassiana* in the intestinal contents of the different test insects were as follows: *G. mellonella*, moderate; *B. mori*, low; *T. molitor*, moderate; *Peridroma margaritosa* (Haworth), none. For *Metarrhizium anisopliae: G. mellonella*, abundant; *B. mori*, low; *T. molitor*, low; *P. margaritosa*, very low. Other media used showed abundant germination for both species of fungi in 2 percent peptone water; none to very few in water abundant in the blood of the insects used except in *P. margaritosa*, where there was none." (319)

Gahan, A. B. 1917. Descriptions of some new parasitic Hymenoptera. U. S. Nat. Mus. 53:195-217.
The description of male and female, type-locality, type, and host are given for *Rogas perplexus*. The variegated cutworm, *Peridroma margaritosa*, is the host.

Garman, H. 1895. Cutworms in Kentucky. Ky. Agr. Exp. Sta. Bull. 58:89-109.
The caterpillar and moth of the variegated cutworm, *Peridroma saucia*, are described briefly. The habits and some food plants are discussed. (97-98) The moth is figured.

Garman, H. 1904. Insects injurious to cabbage. Ky. Agr. Exp. Sta. Bull. 114:15-47.
The occurrence, habits, food plants, and appearance of *Peridroma margaritosa* are discussed. The moth, larva, and egg are figured. (34-35)

Garman, H. 1920. Observations on the structure and coloration of the larval corn earworm, the budworm, and a few other Lepidopterous larvae. Ky. Agr. Exp. Sta. Bull. 227:55-84.
"*L. margaritosa* shows under the microscope a definite areolation, however, especially conspicuous in the more deeply pigmented regions but everywhere present. The microscopic structure of the cuticle was compared with two species of Chloridea, *Alabama argillacea* and *Acronycta oblinita*." (57)

Gibson, A. 1903. Some interesting habits of Lepidopterous larvae. 33rd Annu. Rep. Entomol. Soc. Ont.:1-132.
The variegated cutworm, *Peridroma saucia*, was cited as a general feeder. During July and August 1900, variegated cutworms fairly swarmed in British Columbia, Oregon, and Washington, devouring plants of all kinds. The estimated monetary loss from this outbreak in U. S. and Canada was $2.5 million. (74)

Gibson, A. 1909. Insects of the year 1908 at Ottawa. 39th Annu. Rep. Entomol. Soc. Ont. 1908:1-152.
A rather interesting occurrence of the variegated cutworm, *Peridroma saucia* Hbn., was discovered in one of the greenhouses at the Central Experimental Farm near Ottawa where they were attacking *Primula*. (119) The moth, larva, and egg of the variegated cutworm are figured. (120)

Gibson, A. 1910. Reports on insects of the year. 40th Annu. Rep. Entomol. Soc. Ont. 1909:1-144.
An outbreak of cutworms occurred at Carp, Ont., and were thought to be variegated cutworms (*Peridroma saucia*). (11)

Gibson, A. 1912. Cutworms and armyworms. Can. Dep. Agr. Entomol. Bull. 3:1-29.
The appearance, habits, life history, and distribution of the variegated cutworm are discussed. (17-19)

Gibson, A. 1912. Reports on insects of the year. 42nd Annu. Rep. Entomol. Soc. Ont. 1911:1-114.
Cutworms were very destructive and the larva of *Peridroma saucia* was one of the most abundant species. (15) The moth, caterpillar, and egg of the variegated cutworm are figured. (10)

Gibson, A. 1913. Report on insects for the year 1912. 43rd Annu. Rep. Entomol. Soc. Ont. 1912:1-143.
The variegated cutworm, *Peridroma saucia*, was occasionally destructive in greenhouses. The caterpillars attacked carnations and were climbing up the plants and eating out the contents of the buds. (17)

Gibson, A. 1914. Report on insects of the year 1913. 44th Annu. Rep. Entomol. Soc. Ont. 1913:1-131.
The variegated cutworm, *Peridroma saucia*, was responsible for damage to carnations in a greenhouse in Ottawa. Practically the only injury was to the buds which were in many instances entirely eaten out during the night by the caterpillars. The characteristic damage is figured on page 16. (18)

Gibson, A. 1915. The control of cutworms. Agr. Gaz., 2(4):330-332.
During 1914, the Kansas grasshopper poison bran formula was found to be effective in controlling the variegated cutworm. This formula included 20 lb. bran, 1 lb. Paris green, 2 qt. syrup, 3 oranges or lemons, and 3-1/2 gal. water.

Gibson, A. 1915. Reports on insects of the year 1914. 45th Annu. Rep. Entomol. Soc. Ont. 1914:1-152.
The variegated cutworm (*Peridroma saucia*) made itself notorious in a Niagara Falls greenhouse by attacking the heads of chrysanthemums. (25)

Gibson, A. 1915. Cutworms and their control. Dom. Can. Dep. Agr. Entomol. Br. Bull. 10:1-31.
Lycophotia saucia occurs periodically in destructive numbers in Canada. There is no limit to the number of host plants. There are probably two generations in Canada annually, the moths appearing in June and again after the middle of August. The species may hibernate in the pupal or adult stage.

Gibson, A. 1923. Report of the Dominion entomologist, 1919 and 1920. Can. Dep. Agr.
The variegated cutworm, *Lycophotia margaritosa* Hbn., was reported from a few localities in Ontario, chiefly due to injury to corn and tomatoes. (7)

Gibson, A. and W. A. Ross. 1940. Insects affecting greenhouse plants. Can. Dep. Agr. Pub. 695:1-88.
This common and widely distributed cutworm, *Peridroma margaritosa*, is occasionally found in destructive numbers in greenhouses. The species is cosmopolitan in distribution and in Canada occurs almost everywhere. Outdoors, in one season alone, in Canada and the United States, crops having a market value of more than $2 million were destroyed by this cutworm. The egg, larva, pupa, moth, and control measures are described.

Gilbert, H. A. 1939. Explorations of the hypopharynx in noctuid larvae. Can. Entomol. 71:231-237.

In certain larval studies, the author was impressed by differences observed in the structure of the hypopharynx. He hypothesized that this structure would at least present generic characters of value in differentiating noctuid larvae. The hypopharynx of *Peridroma margaritosa* is illustrated, as well as the glassy cutworm, the armyworm, the corn earworm, and the pale western cutworm.

Gillette, C. P. 1891. Notes on habits and life histories of certain cutworms and cutworm moths. Iowa Agr. Exp. Sta. Bull. 12:535-549.
The variegated cutworm, *Agrotis saucia*, is one of the climbing cutworms and is abundant in central Iowa. The cutworms feed freely upon leaves of soft maple, box-elder, elm, apple, cherry, currant, raspberry, rose, corn, grass, and purslane. The moths are most abundant during October. (540-541)

Gillette, C. P., *et al.* 1924. Fifteenth annual report of state entomologist of Colorado for the year 1923. Office State Entomol. Colo. Circ. 43:1-71.
"Variegated Cutworm, *Peridroma saucia*. This species is sometimes called the alfalfa cutworm because of its abundance in the alfalfa fields. It also ruins many tomatoes by eating holes in the fruit. The past summer and fall, serious complaints of injuries from this cutworm to head lettuce and to celery have been received, and especially in the gardens about Denver and Canon City. A Denver celery grower reported destroying 1,500 of this cutworm in a day, taken by hand from beneath the wrappings on his celery plants." (27)

Glendenning, R. 1923. Insects of economic importance in the Fraser Valley in 1921. Proc. Entomol. Soc. Brit. Col. 17-19:167-172.
"Cutworms. With the exception of the variegated cutworm (*Lycophotia margaritosa* Haw.), little damage from these insects came to my notice. The above exception was, however, plentiful in August in various points in the Valley, and one record of damage was received from Golden in the Columbia Valley. No parasites were recovered from material reared and collected at Agassiz; we therefore may possibly have an epidemic next year, as was the case in 1900 and 1905. Tomatoes were the chief crop affected, and the climbing habit of this species was demonstrated on this host, the fruits being eaten right to the top of the plant. Some damage to mangolds and beets was reported from Lulu Island in June from cutworms, but the species was not ascertained." (168)

Goeden, R. D. 1971. The phytophagous insect fauna of milk thistle in southern California. J. Econ. Entomol. 64(5):1101-1104.
"A diverse assemblage of phytophagous insects representing 6 orders, 24 families, and more than 47 species fed or reproduced on milk thistle *Silybum marianum* (L.) Gaertner (Compositae) in southern California. Only the variegated cutworm, *Peridroma saucia* (Hübner), appeared to directly injure the flower heads. Its larvae fed at the bases of opened and unopened flower heads; they occasionally severed the peduncles, but usually destroyed only a portion of the developing achenes. At best less than 1% of the flower heads at our survey sites were infested by this species." (1102)

Gossard, H. A. 1917. Cutworms, their habits, characteristics, and means of control. Ohio Agr. Exp. Sta. Mon. Bull. 2:85-90.
The variegated cutworm is one of the most common and destructive cutworms in Ohio. Predators include robins, blackbirds, bluebirds, crows, chickens, toads, skunks, shrews, ground beetles, tiger beetles, and digger wasps. Poisoned cereal baits were recommended for control.

Gossard, H. A. 1918. Report of committee on entomology (1917). Ohio State Hort. Soc. Rep. 51:43-47.

"These common pests, cutworms and wireworms, were very plentiful but owing to the rank, rapid growth of garden truck, their ravages were hardly noticed. The variegated cutworm, *Peridroma margaritosa saucia*, and the glassy cutworm, *Hadena devastatrix*, were reported to be the worst offenders." (44)

Gould, G. E. 1960. Problems in the control of mint insects. J. Econ. Entomol. 53:526-531.
Insect abundance has often been a factor in the economical production of mint oil. More than 54 species of insects and related pests have been found associated with peppermint, spearmint, and wild mint in Indiana and neighboring states. The variegated cutworm, *Peridroma margaritosa*, is one of the 54 insects. (527)

Grandfield, C. O. and R. I. Throckmorton. 1945. Alfalfa in Kansas. Kans. Agr. Exp. Sta. Bull. 328:1-64.
Variegated cutworms were most serious in June. They caused severe damage to alfalfa. Methods of control are discussed. (57-58)

Grayson, J. M. 1944. Two important parasites of the tobacco budworm. J. Econ. Entomol. 37(5):712-713.
The ichneumonid parasite *Sagaritis provancheri* D. T. has been recorded from *Peridroma saucia*. (713)

Grote, A. R. 1873. VIII. Descriptions of Noctuidae principally from California. Bull. Buffalo Soc. Nat. Sci. 1:129-155.
"*Agrotis saucia* (Hübner). Habitat California (Coll. Mr. Hy. Edwards, No. 157). The American specimens, described by Harris as *Agrotis inermis*, are not distinguished." (135)

Grote, A. R. 1875. Check list of the Noctuidae of America, north of Mexico. Beinecke & Zesch., Buffalo, N. Y. (1):1-28.
The variegated cutworm is listed as number 188. *Agrotis saucia* (Hübn). and synonyms are *Agrotis inermis* Harr. and *Agrotis ortonii* Pack. (7)

Grote, A. R. 1882. New checklist of North American moths. New York Entomol. Club. 73 pp.
The variegated cutworm is included in this checklist as *Agrotis saucia* (Hübner). *Agrotis inermis* Harris, *Agrotis ortonii* Pack., and variety *margaritosa* Haworth are listed as synonyms and varieties. (26)

Grote, A. R. 1895. List of North American Eupterotidae, Ptilodontae, Thyatiridae, Apatelidae and Agrotidae. Abhandlungen des Bremer Naturwissen. Vernins. 14:44-128.
In this faunal list, the variegated cutworm appears as number 84 "*saucia* Hbn." (synonyms) *inermis* Harris, *ortonii* Packard (variety) *margaritosa* Haw. (61)

Güenée, A. 1852. Species Géneral des Lépidoptéres. Noctuelites. 1:157, 271.
The moth is described in Latin.

Hansberry, R., W. W. Middlekauff, and L. B. Norton. 1940. Toxicity of nicotine administered internally to several species of insects. J. Econ. Entomol. 33(3): 511-517.
Nicotine was administered in measured doses in two ways: by feeding leaf sandwiches containing known amounts of nicotine and measuring the areas eaten, and by injection of the nicotine directly into the blood or gut with a micro-syringe.

Larvae which were not susceptible to nicotine included those of the variegated cutworm, *lycophotia margaritosa saucia* Hbn. (516)

Harper, J. D. 1970. Laboratory production of *Peridroma saucia* and its nuclear polyhedrosis virus. J. Econ. Entomol., 63(5):1633-1634.
"Previously published methods for rearing the variegated cutworm, *Peridroma saucia* (Hübner), were modified to maintain a culture of this species. Laboratory stock cultures and cultures which produced 200+ new larvae per day were successfully maintained by 11 generations by using both bean medium and fresh natural food. Methods are described which are suitable for producing and purifying sufficient amounts of *P. saucia* nuclear polyhedra for experimental laboratory and field testing. Most of the techniques described can be carried out without special equipment." (1633)

Harper, J. D. 1971. Preliminary testing of a nuclear polyhedrosis virus to control the variegated cutworm on peppermint. J. Econ. Entomol., 64(6):1573-1574.
"Application of a mixture of nuclear polyhedrosis viruses of the alfalfa looper *Autographa californica* (Speyer) and the variegated cutworm *Peridroma saucia* (Hübner) to peppermint suggested that the virus would not affect oil flavor. The study reported here was designed to provide additional information on whether this type of virus or its inclusion would affect adversely the quality of mint oil." (1573)

Harrendorf, K. 1959. Occurrence and relative abundance of certain noctuid moths in northwest Arkansas, Fall 1957. J. Kans. Entomol. Soc. 32(1):41-44.
Those species of Noctuidae commonly referred to as cutworms cause considerable economic damage to northwest Arkansas crops each year. Since several species are involved, it is important that those species present and their relative abundance be known. The two methods, light trap collections and bait line collections, were employed in a qualitative and quantitative study of those species of noctuids present in northwest Arkansas in the fall of 1957. No records were taken of those species known not to be in the group commonly referred to as cutworms. (41) *Peridroma margaritosa* specimens were taken up to Nov. 18, with three the maximum catch on any single night. (43)

Harrendorf, K. and R. E. Klutts. 1967. Insecticidal activity of hexamethylditin (Pennsalt TD-5032) on six species of Noctuidae. J. Econ. Entomol. 60(5):1471-1472.
Topical applications of hexamethylditin (Pennsalt TD-5032) at the following dosages gave the following mortalities in the variegated cutworm after 48 hours: 0.156 µg - 4.0%, 0.312 µg - 20.0%, 0.625 µg - 20.0%, 1.25 µg - 68.0%, and 2.5 µg - 84.0%. (1472)

Harris, C. R. 1970. Insecticide pollution and soil organisms. Proc. Entomol. Soc. Ont., 100:14-29.
"Information available at present indicates that although residues of some organochlorine insecticides are accumulating in soils, they are not generally resulting in serious deleterious effects on soil microorganisms or soil animals. Some insect pests have become resistant to the cyclodiene insecticides, and population shifts also have occurred, resulting in serious insect control problems. Because of magnification, minute residues in crops may result in unacceptable residue levels in milk and animal products. The most serious problem is that of general environmental contamination with certain organochlorine insecticides and the side effects which may occur. Because of these side effects, the organochlorine insecticides are being rapidly replaced with organophosphorus

and carbamate compounds, partly because of a popular misconception that these newer materials are less persistent. Data are presented to show that this is not necessarily the case. While advocating restrictions on the use of the organochlorine insecticides, the author suggests caution in haphazardly replacing them with materials which may have even more serious environmental side effects." (14)

Harris, C. R. and H. J. Svec. 1968. Toxicological studies on cutworms. I. Laboratory studies on the toxicity of insecticides to the dark-sided cutworm. J. Econ. Entomol., 61(3):788-793.
"Cutworms are a serious pest of agricultural crops in many areas of Canada and the United States. In Ontario there are at least three species of economic importance: the dark-sided cutworm, *Euxoa messoria* (Harris); the black cutworm, *Agrotis ipsilon* (Hufnagel); and the variegated cutworm, *Peridroma saucia* (Hübner). The cyclodiene insecticides were effective in controlling these species. However, because of the longevity of residues of some of these materials in soil and their absorption by crops, their use is now extremely limited. Consequently, it has been necessary to initiate studies to find less persistent alternative materials." (788)

Harris, C. R. and H. J. Svec. 1968. Toxicological studies on cutworms. IV. Laboratory investigations on the toxicity of insecticides to the variegated cutworm, with special reference to method of application on insecticidal activity. J. Econ. Entomol., 61(4):970-973.
"Laboratory tests indicated that five of seven insecticides tested as direct-contact poisons against third and fourth instar variegated cutworms, *Peridroma saucia* (Hübner), were more effective than aldrin. The most toxic was Lannate methyl N-[(methylcarbamoyl) = oxy] thioacetimadate) > DDT > parathion > Dursban (0, 0-diethyl 0-3, 5, 6-trichloro-2-pyridyl phosphorothioate) > Ciba 8874 (0-2, 5-dichloro-4-iodophenyl) 0,0-diethyl phosphorothioate. Birland (2-chloro-1-(2,4-dichlorophenyl) vinyl diethyl phosphate) and Bayer 37289 (0-ethyl 0-2,4, 5-trichlorophenyl ethylphosphonothioate) were slightly less toxic than aldrin. As soil surface applications, Dursban and aldrin were highly effective; DDT, parathion, and Bayer 37289 were only slightly less so; and Lannate was ineffective." (970)

Harris, C. R., G. F. Manson, and J. H. Mazurek. 1962. Development of insecticidal resistance by soil insects in Canada. J. Econ. Entomol., 55(5):777-780.
The common cutworm species of economic importance in southwestern Ontario, *Agrotis ipsilon* (Hufnagel) and *Peridroma saucia* (Hübner), showed no indication of cyclodiene resistance. The organophosphate insecticides were generally less toxic to cutworms than the cyclodiene insecticides. The dark-sided cutworm, *Euxoa messoria* (Harris), was highly tolerant to dieldrin, DDT, and diazinon.

Harris, C. R., J. H. Mazurek, and G. V. White. 1961. Bioassay of organic insecticides in terms of contact toxicity, to the variegated cutworm, *Peridroma saucia* (Hübner) (Lepidoptera:Noctuidae). Proc. Entomol. Soc. Ont. 92:200-202.
The variegated cutworm, *Peridroma saucia* (Hübner), periodically causes severe damage in tobacco fields in southwestern Ontario. Present control recommendations are based primarily on the results of field experiments. These results, however, are often inconclusive because cutworm outbreaks are difficult to predict and usually are unevenly distributed. To assist in the development of control recommendations, the contact toxicity of five chlorinated hydrocarbon insecticides to fourth instar larvae of *P. saucia* (Hbn.) was determined by bioassay. (200)

Harris, T. W. 1841. Report on the insects of Massachusetts injurious to vegetation. John Owen, Cambridge, Mass. 459 pp.
The author named the unarmed rustic moth (variegated cutworm), *Agrotis inermis* n. sp. This name was later referred to synonomy with *Peridroma saucia*. (323)

Harris, T. W. 1842. A treatise on some of the insects injurious to vegetation. Cambridge University Press, Cambridge, Mass., 459 pp.
Harris described the unarmed rustic moth, *Agrotis inermis*. (323) The species was later proved to be the same as *Peridroma saucia*.

Hart, C. A. 1903. Synopsis of insect collections for distribution to Illinois high schools. Ill. State Lab. Nat. Hist.:1-64.
"109. *Peridroma margaritosa saucia* Hübn. (*Agrotis saucia*, *P. saucia*). Unarmed Owlet; l. Variegated Cutworm. F., cultivated fruits, vegetables, and flowers. H. as larva, etc.; l. destructive in May and early June; pupates in cell in earth; I, late June into Aug.; possibly, II in late Aug. and fall. Larvae common in gardens, ascend trees at night; large egg patches common on twigs of apple, etc.; adults common 'at sugar'. On trees use tin and other bands as barriers to climbing and jar larvae from trees upon cloths so they can be gathered and destroyed. Ground color of forewings variable, hind wings pearly whitish except margins, veins dark, strongly marked." (29)

Haworth, A. H. 1803. Lepidoptera Brittannica; Sistens Digestionem Insectorum Lepidopterorum Guae in Magna Brittania Reperiuntur. 1-609.
The variegated cutworm moth is described as "the pearly underwing" (*Noctua margaritosa*). The host is listed as potato, "*Solanos tuberosos*." (213)

Haworth, A. H. 1809. Lepidoptera Brittannica, Part II:157.
For many years this was believed to be the original description of the species. Hemming's study showed that Hübner's *Noctua saucia* was published prior to 1809 and therefore has priority.

Headlee, T. J. 1908. Insects and other animals injurious to alfalfa. Kans. State Agr. Coll., Agr. Exp. Sta. Bull. 155:181-345.
"Cutworms (plump caterpillars one and three-fourths to two inches long when fully grown, of dull brown, gray or greenish hue, generally marked with longitudinal stripes, oblique dashes and dots, with head and following segment reddish-brown and horny). These insects, among which the variegated cutworm (*Peridroma saucia* Hübn.) is most common, occasionally do serious damage to alfalfa. Our correspondence indicates that they damage the crop during late spring, principally in May, but they might well appear throughout the summer. The variegated cutworm is a wide feeder, working on field, garden, and greenhouse plants as well as on the foliage and fruit of trees. It passes the winter as a larva in the soil, emerging from winter quarters in the late spring. The second generation of worms appears in July and August, and a partial third generation in the fall." (336-337)

Heath, E. F. 1901. Notes on the occurrence of lepidoptera, etc., in southern Manitoba. Can. Entomol. 33:98-100.
"*Peridroma saucia*, Hbn., and *ypsilon*, Rott., and *Carneades messoria*, Harr., the larvae of which are so destructive, were all more abundant than usual" (in southern Manitoba in 1901). (99)

Heath, E. F. 1902. A few notes on the lepidoptera of 1901 in southern Manitoba. Can. Entomol. 34:33-36.

"On May 14 I netted a dozen or so moths--and could have taken many more--flying, in the dusk, about some wild plum trees which were then in bloom, and much to my disgust I found them to be nothing but worn, hibernated *Peridroma saucia*. Where did they come from? *P. saucia* was not in unusual numbers the year before, and I have very seldom taken any at this early date in previous years." (34)

Heath, E. F. 1906. A few notes on the lepidoptera of 1905. Can. Entomol. 38:218-220.
"*Peridroma saucia*, Hbn., came out in great force later on, and in endless variety. It was accompanied by *Dargida procinctus*, Grt., of which I took 15 or 16 examples, five or six times as many as I have seen during all my previous years of collecting. I think I recollect having seen it stated that when 3 or 4 years ago, the larvae of *saucia* did so much damage in British Columbia, the larvae of *procinctus* were also found with them." (218)

Hemming, Francis. 1937. Hübner, a bibliographical and systematic account of the entomological works of Jacob Hübner. Roy. Entomol. Soc. London 1:257.
The author was able to place a tentative date on the different parts of Geschichte Europaischer Schmetterlinge by Hübner by studying contemporary works written between the years 1793 and 1842. Thus he decided that Lepidoptera IV Noctuae 1 (containing plate 81, fig. 378 *Noctua saucia*) was published between July 1803 and some time in 1808.

Herrick, G. W. 1925. A manual of injurious insects. Henry Holt and Co., N. Y. 489 pp.
The moth, larva, distribution, appearance, life history, and control measures of the variegated cutworm are discussed. (252-253)

Hewitt, C. G. 1915. Report from the Division of Entomology for the year ending March 31, 1914. Can. Dep. Agr. Dom. Exp. Farms, Ottawa:851-876.
The variegated cutworm was reported as a greenhouse pest. The cutworms destroyed carnations by eating out the interiors of the flower buds. (870)

Hewitt, C. G. 1915. Report of the Dominion entomologist for the year ending March 31, 1915. Can. Dep. Agr.:20.
"From British Columbia the variegated cutworm (*Peridroma saucia*) was received; at Agassiz, B. C., field turnips, mangels, garden turnips, and cabbages suffered severely; red currant bushes were also defoliated."

Hewitt, C. G. 1917. Report of the Dominion entomologist for the year ending March 31, 1916. Can. Dep. Agr. 5:3, 67, 72-73.
"*Peridroma saucia* has been present again this summer in the Fraser Valley. Not in marked numbers but sufficient to cause noticeable but localized damage." (67)

Hicks, C. H. 1932. Notes on the prey and inquilines of *Podalonia violaceipennis* form *luctuosa* (F. Smith). Psyche., 39(4):150-154.
The variegated cutworm was found to be a prey of the digger wasp, *Podalonia luctuosa*. The wasp captures cutworm larvae and stores them for food for its young. (151)

Hinks, C. F. 1970. The neuroendocrine organs in adult Noctuidae. Can. J. Zool., 48(4):831-835.
"A detailed study of the innervation of the neuroendocrine organs in eight species of Noctuidae revealed a previously undescribed network of nerves. A dorsal branch of the outer pair of nerves connecting the protocerebrum with

the corpora cardiaca bears fine nerves extending to the ocellar, antennal, and optic nerves and to the orbital setae. A distinct ventrally directed nerve arising from each corpus cardiacum has branches extending to the optic, maxillary, and palpal nerve and lateral orbital setae. The possible significance of these nerves is discussed in the context of known endocrine functions. The following species, obtained either from mercury-vapor light traps or from laboratory-maintained colonies were used: *Agrotis ipsilon* Hufn., *Amathes smithi* Snell., *Amathes c-nigrum* Linn., *Feltia herilis* Grt., *Peridroma saucia* Hbn., *Cucullia intermedia* Speyer, *Xylina nupera* Lint., *Catocala unijuga* Walk." (831)

Hinks, C. F. and J. R. Byers. 1973. Characters for determining the sex of the cutworms and other noctuid larvae (Lepidoptera:Noctuidae). Can. J. Zool. 51:1235-1241.
External structures were found which permitted the accurate determination of males or females in the larvae of each of 40 species of noctuids, including *Peridroma saucia*. (1235)

Hoffman, C. H. 1945. Insect pests of cultivated goldenrod. J. Econ. Entomol., 38(3):355-358.
"The variegated cutworm, *Peridroma margaritosa* (Haw.), attacked some caged goldenrod plants at Asheville, N. C., and caused severe defoliation in a few days time." (357)

Hofmaster, R. N., R. L. Waterfield, and J. C. Boyd. 1967. Insecticides applied to the soil for control of eight species of insects on Irish potatoes in Virginia. J. Econ. Entomol., 60:1311-1318.
"Field experiments to control eight species of insects were conducted on Irish potatoes in southeastern Virginia from 1961 to 1966. Twenty-five different compounds in several formulations, rates, and methods of application were evaluated as soil insecticides." (1311) "Chlordane, diazinon, and dieldrin gave highly significant reductions in injury, but the decrease of only 65% could not be regarded as a practical control measure. Dasanit banded at 4 lb. actual/acre decreased cutworm injury 88%, but this dosage caused extensive phytotoxicity. The other systemics, phorate, disulfoton, and Isolan, were ineffective, as was to be expected, since these chemicals had largely dissipated by the time the cutworms became active. Of the remaining insecticides, only Compound 4072 at 4 lb./acre and Bay 37289 at 8 lb./acre showed any degree of promise." (1317)

Hogg, P. G. 1951. Cutworm control measures outlined on basis of tests. Miss. Farm Res., 14(2):5.
"A severe infestation of the variegated cutworm, *Peridroma margaritosa* (Haw.), occurred in a 3-acre experimental plot of ladino clover at the Delta Branch, Mississippi Agricultural Experiment Station, Stoneville, in 1949. Almost complete defoliation and loss of hay crop was experienced in this plot. An application of 30 lb. of 20 percent toxaphene dust, after most of the leaves had been eaten, indicated that this insecticide might be used successfully in combating this species of cutworm."

Holland, W. J. 1968. The moth book. Dover Publications, Inc., New York. 479 pp.
"(4) *Peridroma saucia* Hübner, Plate XXI, Fig. 40, ♀ ; Egg, Text-figure No. 2. (The Common Cutworm.) Syn. *inermis* Harris; *ortonii* Packard. Almost universally distributed throughout the United States and southern Canada. It also occurs in Europe." (182) The moth is figured in color.

Howard, L. O. 1899. The principal insects affecting the tobacco plant. U. S. Dep. Agr. Yearbook, 1898:121-150.
Peridroma saucia was considered a pest of tobacco. Paris green was suggested for use either in a poison bait or sprayed on vegetation on which cutworms feed. The egg, larva, and moth of the variegated cutworm are figured.

Howland, A. F., T. J. Henneberg, and W. W. Wolf. 1971. Comparison of cabbage looper and other moth species caught in blacklight traps baited or unbaited with unmated females. J. Econ. Entomol., 64(4):977-978.
The variegated cutworm, *Peridroma saucia*, apparently showed no preference for baited or unbaited blacklight traps. The baited traps contained unmated cabbage looper females.

Hubbard, R. L. 1956. Bitterbrush seedlings destroyed by cutworms and wireworms. Forest Res. Notes, Calif. Forest and Range Exp. Sta., U. S. Dep. Agr. No. 114: 1-2.
The variegated cutworm was believed to have caused most of the damage to bitterbrush seedlings in northeastern California. It is the most important and most common species of cutworm throughout the West. (2)

Hübner, J. 1816. Verzeichniss bekannter Schmettlinge, Augsburg, Ger. 431 pp.
This publication contains keys to groups of related species. On page 227, *P. saucia* falls into a grouping with *P. aequa*, *P. idonea*, and *P. suffusa*.

Hughes, K. M. 1957. An annotated list and bibliography of insects reported to have virus diseases. Hilgardia, 26(14):597-629.
"*Peridroma margaritosa* (Haw.), variegated cutworm. Polyhedrosis. (192) Granulosis (16, 18, 183, 185, 196, 187, 190, 194, 195, 254)." (605) (The above numbers refer to published references.)

Hughes, K. M. 1958. The question of plurality of virus particles in insect-virus capsules and an attempt at clarification of insect virus terminology. Trans. Amer. Micros. Soc. 77:22-30.
"The phenomenon of the 'wheat-like' appearance of some insect virus capsules and the relationship of this phenomenon to the number of virus particles contained within such capsules are discussed. An attempt is made to clarify some of the terms used in the literature on insect viruses." (29) Only one of the three wheat-like viruses, that affecting *P. saucia*, was available to the author in a fresh state. (28)

Hutchings, C. B. 1926. Report of insects of the year 1925. 56th Annu. Rep. Entomol. Soc. Ont. 1925:1-111.
The total loss from cutworms in the spring of 1925 was not exceptional, but there were a number of districts where there were small outbreaks. The most damage was done in New Ontario where the variegated cutworm (*Peridroma margaritosa*) was one of the main species found. (16)

Ignoffo, C. M. and O. P. Boening. 1970. Compartmented disposable plastic trays for rearing insects. J. Econ. Entomol., 63:1696-1697.
This report deals with the use of compartmented disposable plastic trays for rearing insects. Minimal handling, artificial diet, and individual rearing compartments significantly reduce risks of external contamination and minimize spread of disease among individuals, both serious problems of rearing insects. Variegated cutworms, *Peridroma saucia*, were reared from neonates to pupation using the described polystyrene trays. (1696)

Ionescu, M. *et al.* 1962. Contributions to the study of cutworms (*Agrotis*) injurious to maize crops. Anal. Inst. Cent. Cerc. Agr. 29:445-451.
The variegated cutworm, *Peridroma saucia*, was found to be a pest of corn in Bucharest, Romania. (275)

Ivy, E. E. and A. L. Scales. 1950. Dieldrin for cotton insect control. J. Econ. Entomol., 43:590-592.
"Variegated cutworm, *Peridroma margaritosa* (Haw.). A dust containing 2.5 percent dieldrin killed all the third instars of this cutworm in the test. Lower concentrations were not tested." (592)

Jaques, H. E. 1920. Recent armyworm and variegated cutworm outbreaks in Iowa. Proc. Iowa Acad. Sci., 27:343-357.
"The variegated cutworm (*Peridroma saucia*), while having a rather wide range of food plants, seems to favor the leguminous crops and is so destructive to alfalfa as to be aptly termed the 'alfalfa cutworm.' The region of heaviest infestation of this pest in Iowa in 1919 was in the southwestern part of the state. Page County was one of the counties hardest hit. Alfalfa, clover, and wheat suffered severely. An active control campaign was conducted with good results as shown by a special report of County Agent Eichling. Montgomery and Pottawattamie counties seem to come next in order of severity. Further east in Marion, Mahaska, Jefferson, Van Buren, and other counties, it seems that the armyworm (*Leucania unipuncta* Haworth) did more damage than the variegated cutworm. In the counties still further east, the armyworm held the field unchallenged by its closely related competitor." (344-345)

Jewett, H. H. 1955. Controlling tobacco insects. Ky. Agr. Ext. Serv. Circ. 525: 1-38.
The variegated cutworm, *Peridroma margaritosa* (Haw.), a common and destructive species, very likely lives overwinter in the pupal stage. It appears early in the spring as an adult and four generations may develop during a year. The larva and moth are illustrated. (20)

Johnson, W. G. 1898. The black peach aphis-cutworms in young tobacco. Law providing for the suppression and control of insect pests and plant diseases in Maryland. Md. Agr. Exp. Sta. Bull. 55:137-149.
For many years the tobacco growers of Maryland have suffered serious annual losses from the ravages of cutworms. These losses are becoming more apparent in sections where crimson clover and other crops are grown on the tobacco lands for turning down in the spring as a soil crop. The variegated cutworm, *Peridroma saucia*, is one of the most common cutworms found on tobacco in Maryland.

Keirns, V. E. 1954. Growing greenhouse tomatoes. Ohio Agr. Ext. Serv. Bull. SB-10: 1-59.
The species of climbing cutworm which most commonly attacks greenhouse tomatoes is the variegated cutworm. Larval appearance and habits are described.

Kimball, C. P. 1965. The Lepidoptera of Florida. An annotated checklist. Fla. Dep. Agr., Div. Plant Ind., Gainesville. 363 pp.
"*Peridroma* Hübner 1496 *P. margaritosa* (Haworth). Variegated cutworm. Pl. XI. Fig. 20, ♀ . Lep. Brit. p. 218. 1809. Although *margaritosa* has been recorded from almost every part of the state, including the Dry Tortugas, it does not seem to be especially common as it is in the north. The dates include October-August. The form *saucia* (Hübner) is infrequent. Larva a general feeder; tomatoes, Watson (1914 pp. 57-78); *Nicotiana tobacum*, Coop. Ins. Pest Surv. 8:28." (86-87)

Kloet, G. S. and W. D. Hincks. 1945. A check list of British insects. T. Buncle & Co., Ltd. 483 pp.
"*Peridroma* Hübner 1821 *Agrotis* auctt. partim *saucia* (Hübner 1803/8)" (93)

Kloet, G. S. and W. D. Hinks. 1972. A checklist of British insects. 2nd Ed., Pt. 2: Lepidoptera. Roy. Entomol. Soc. London:1-153.
The authors summarize the synonomy of the species as follows:
Peridroma Hübner, 1821
saucia (Hübner, 1803-1808)
margaritosa (Haworth, 1809)
majuscula (Hayworth, 1809)
aequa (Hübner, 1809-1813)
porphyrea sensu Edelsten, 1939

Knott, J. E. and A. A. Tavernetti. 1944. Production of head lettuce in California. Calif. Agr. Ext. Serv. Circ. 128:1-51.
The variegated cutworm is a common pest of young lettuce plants in California. Methods of control are discussed. (36)

Knowlton, G. F. 1958. Some Utah insects. Part II. Utah State Univ. Ext. Serv. 171-A.:9-13.
"*Peridroma margaritosa* (Haw.) Larvae in alfalfa at Gunnison July 31 and Logan Sept. 8, 1957. Larvae were numerous and severely damaging celery at Tremonton Oct. 2, 1958. (K. and R. Finch); Ogden and Benjamin, August 4-8; Vernal, June 27 (W. F. Farnsworth); damaging flowers in home garden at Randolph, July 30 (W. F. Maughan); Spanish Fork, July 27." (12)

Knowlton, G. F., W. J. Hanson, and T. L. Whitworth. 1974. Investigations of the Noctuidae (Lepidoptera) in Curlew Valley. Proc. Utah Acad. Sci., Arts, and Lett., 51(1):45-49.
"*Peridroma saucia* (Hbn.) Locomotive Springs, August 9-26, malaise trap." (47)

Knutson, H. 1944. Minnesota Phalaenidae (Noctuidae): The seasonal history and economic importance of the more common and destructive species. Univ. Minn. Agr. Exp. Sta., Tech. Bull. 165:1-128.
The museum specimens examined, light trap collections, reports of damage, rearing data, seasonal history, and economic importance of the variegated cutworm, *Peridroma margaritosa*, in Minnesota are discussed.

Kohler, P. 1963. Miscellaneous notes on Noctuidae (Lepidoptera Heterocera). IV. The *Peridroma* Hbn. complex. Rev. Soc. Entomol. Argent., 26(1-4):7-11.
By means of an extensive bibliography, including the latest South American publications, the synonomy of *Peridroma saucia* Hbn. and *P. clerica* Btlr. has been determined. Synonyms given include *Noctua saucia* Hbn., *Noctua margaritosa* Haw., and *Noctua mayuscula*.

Lacroix, D. S. 1935. Insect pests of growing tobacco. Conn. Agr. Exp. Sta. Bull. 379:88-130.
The variegated cutworm is a common pest of tobacco in Connecticut. Its appearance, habits, other food plants, and distribution are discussed. Control of cutworms in general is also discussed. (99)

Lange, W. H., Jr. 1941. The artichoke plume moth and other pests injurious to the globe artichoke. Univ. Calif. Agr. Exp. Sta. Bull. 653:1-71.

"Of the noctuids, the caterpillars of the variegated cutworm, *P. margaritosa* (Haw.), often do considerable injury by feeding on the tender leaf stalks and eating out the insides of the floral heads" (of globe artichokes). (56)

Lange, W. H., Jr. 1944. Insects affecting guayule with special reference to those associated with nursery plantings in California. J. Econ. Entomol., 37:392-399.
"The variegated cutworm, *Peridroma margaritosa* Haw., is one of the most common cutworms in the Salinas Valley region. It occasionally feeds on guayule seedlings at almost any time of the year." (396)

Lange, W. H., Jr. 1947. Sugar beet insects and nematodes and their control. Spreckels Sugar Beet Bull., 11(1):1-40.
The variegated cutworm, *Peridroma margaritosa* (Haworth), is one of the most common cutworms attacking a variety of hosts. Control methods are discussed. (5)

Lauri, A. and D. C. Kiplinger. 1947. Garden and greenhouse chrysanthemums. A. T. De La Mare Company, Inc., New York. 123 pp.
"These are larvae of many night flying moths. Besides cutting off young plants, the variegated cutworm eats the foliage and finds its way into the flowers, making them unsalable. Most of the damage occurs in May, June, and July. Sterilization of all soil is advised as one means of control. Poisoned bran mash is a very efficient remedy and should be placed in piles along the benches early in the evening. Cutworms feed at night or on dull days in the afternoon." (64)

Legrand, J. F. 1919. El tabaco (*Nicotiana tabacum*, L.). Revista de Agric. de Puerto Rico, 3(6):1-14.
The variegated cutworm is described as a pest of tobacco in Puerto Rico. The larva, adult, and damage to tobacco are illustrated. (8)

Lempke, B. J. 1962. Catalogus der Nederlandse Macrolepidoptera. Tijdschrift Voor Entomologie, Deel. 105:149-232.
The author describes the moth of the variegated cutworm and the localities in Holland from which it is recorded. Six forms of the species are listed: *margaritosa, nigrocosta, ochrea-costa, rufa, aequa,* and *brunnea*. (205)

Leonard, M. D. 1928. A list of the insects of New York. Cornell Univ. Agr. Exp. Sta. Mem. 101:1-1121.
"1490 *L. margaritosa* Haw. Variegated Cutworm. The type form and the var. *saucia* Hbn. are very common generally, northward to Albany and Ithaca. Aug.-Nov. A cutworm." (660)

Lhoste, J. 1973. New technique for evaluation of insecticides for control of nocturnal Lepidoptera (*Scotia ipsilon, Peridroma saucia*) (Fre). J. Meded. Fac. Landbouwwet. Rijksuniv Gent., 38(3):1205-1212.
Larvae of black and variegated cutworms were reared on artificial media to third or fourth instar and then exposed to treated soil or foliage. Abate and endosulfan plus dimethoate or parathion were applied to foliage as dusts or to the soil surface. The authors believe the techniques described provide a level of precision in measuring effects of small quantities of insecticides not previously possible. (Translated from French.)

Lincoln, C. and D. Isely. 1945. Armyworms and cutworms. Univ. Ark. Coll. Agr. Ext. Serv. Circ. 436:1-10.

The variegated cutworm (*Peridroma margaritosa*) is the most common species of cutworm in Arkansas.

Lingren, P. D., R. J. Guerra, J. W. Nickelsen, and C. White. 1970. Hosts and host-age preference of *Campoletis perdistinctus*. J. Econ. Entomol., 63(2):518-522.
Larvae of *Peridroma saucia* (2-4 days old) are particularly susceptible to parasitism by the ichneumonid parasite, *C. perdistinctus*. In general eggs were laid on host larvae 1-8 days old, but larvae 2-4 days old were preferred.

Lintner, J. A. 1888. Cutworms. Bull. N. Y. State Mus. Nat. Hist. 6:1-36.
The appearance, habits, natural history, food plants, abundance, literature, natural enemies, parasites, and methods of control of cutworms are discussed. *Agrotis saucia* (variegated cutworm) is listed among the cutworm species found in New York. The larva and moth are figured.

Lintner, J. A. 1889. Cutworms. Trans. N. Y. State Agr. Soc. 34:66-100.
Identical to Lintner, J. A. 1888. (71, 79, 85)

Lintner, J. A. 1889. 5th report on the injurious and other insects of the state of New York. 5:200-206.
Smilax, *Myrsiphyllum asparagoides*, was damaged by the variegated cutworm, *Agrotis saucia* (Hbn.), in conservatories at Lowell, Mass. (16)

Lochhead, W. 1901. Insects of the season of 1900. Annu. Rep. Entomol. Soc. Ont. 31:1-111.
"Cutworms. (*Noctua c-nigrum, Peridroma saucia*, and others.) These night intruders worked considerable damage in gardens and fields during June and July, but the spreading broadcast of handfuls of bran mash, poisoned with Paris green and sweetened with a little sugar, generally put a stop to their depredations in gardens. The most common forms sent in for identification were the variegated cutworm (*Peridroma saucia*) and the spotted cutworm (*Noctua c-nigrum*)." (74)

Lochhead, W. 1918. A few notes on the ecology of insects. 48th Annu. Rep. Entomol. Soc. Ont. 1917:1-128
Treherne noted that black currants and lettuce are practically "immune" from *Peridroma saucia* (variegated cutworm) attack. (88)

Lochhead, W. 1919. Class book of economic entomology. P. Blakiston's Son & Co., Philadelphia. 436 pp.
The larva of *Lycophotia margaritosa* is described. It is active in May and early June and feeds on cereal roots, forage, vegetables, flowers, and fruit trees. (186)

Lovett, A. L. 1915. The variegated cutworm, *Peridroma margaritosa saucia*, Hübn. 2nd Crop Pest and Hort. Rep. 1913-1914. Ore. Agr. Exp. Sta. 2:141-147.
"During the summer of 1914, a serious outbreak of cutworms occurred throughout western and northern Oregon. Practically every type of crop was attacked. Truck and garden crops suffered most, but the injury to the buds and fruit of trees and bushes, field crops, and ornamental shrubs and plants was serious. The injury became most pronounced in early July. It had reached its zenith by early August and then rapidly subsided. The cutworm causing the greater part of the injury is known as the variegated cutworm." (141)

Lowry, W. L. and S. L. Calhoun. 1952. Control of the variegated cutworm [*Peridroma margaritosa*] on cotton with several organic insecticides. (Abstr.) Proc. Assoc. South. Agr. Workers, 49:83.
"In recent years the variegated cutworm, *Peridroma margaritosa* (Haw.), has caused considerable damage to seedling cotton in the Mississippi Delta. During 1951 a number of the newer synthetic organic insecticides were tested at different dosage levels in an effort to learn more about their effectiveness for controlling this pest. The tests consisted of spraying plants in the field, placing cages over the treated plants, releasing larvae in the cages, and recording larval mortality. The most effective chemicals used were a new insecticide designated as Compound 269, dieldrin, DDT, TDE, and toxaphene. Chlordane, EPN, heptachlor, and parathion were relatively ineffective. At the most effective dosage levels, all of the chemicals highly toxic to the variegated cutworm gave good to excellent residual kill when larvae were introduced in cages 48 hours after the plants had been sprayed."

Luckmann, W. H. and G. C. Decker. 1960. A 5-year report of observations in the Japanese beetle control area at Sheldon, Ill. J. Econ. Entomol., 53:821-827.
The variegated cutworm was one of the species killed by dieldrin in areas treated for suppression of a local infestation of Japanese beetles. (821)

Lugger, O. 1899. Butterflies and moths injurious to our fruit-producing plants. Minn. Agr. Exp. Sta. Bull. 61:55-333.
"We quite often find a large number of eggs, of a pinkish color, round and flattened, deposited side by side on the twigs and leaves of the apple and cherry. These eggs hatch into small dull-yellowish worms" (variegated cutworms--*Peridroma saucia*) "with darker spots. The mature caterpillar is of a dull flesh color, mottled with brown and black, and with elongated velvety-black markings on each side. This is one of the most voracious of all cutworms, and may be found at almost any time during the season hidden in the ground near some plant. After reaching a length of about 2 inches it enters the ground to form an oval and smooth cavity in which it changes to a deep mahogany brown pupa. The moth, which expands about an inch and three quarters across, has grayish-brown forewings, marked with brownish-black; the hind wings are pearly white, shaded towards the margin with pale-brown. The caterpillar, eggs, and moth are illustrated in Fig. 158." (214)

Maassen, P. 1870. Ueber Noctuen-Fang. (On collecting noctuids.) Stettiner Entomologische Zeitung. 1870:329-33.
The author describes the "sugaring" method of collecting noctuids, using a mixture of beer and chopped apples applied to trees. One of the forms of *Agrotis saucia* was collected at Elberfeld, Germany, between August 20 and the middle of October. (Translated from German.)

Mackenzie, A. W., *et al.* 1950. Horticulture and biology services. Nova Scotia Dep. Agr. Mark. Rep. for 1948-49:121-134.
"Cutworms, particularly the variegated cutworm, *Peridroma margaritosa* (Haw.), were fairly numerous during the early part of the summer, as indicated by a number of reports from various parts of the province that cabbage and tomato transplants, etc., had been cut off in the field or garden." (127)

Mackie, D. B. 1935. Entomological service. Calif. Dep. Agr. Bull. 24(4);403-430.
"Three species of cutworms, *Lycophotia margaritosa, Xylomyges curialis,* and *Parastichtus purpurea,* have been involved. Damage was confined largely to Tulare County, where it approximated $30,000. Ripening fruits were injured

in some orchards, while in others a major portion of the blossoms were destroyed. An entirely satisfactory control program has not yet been worked out, although studies are under way." (422)

Mackie, D. B. 1936. Entomological service. Calif. Dep. Agr. Bull. 25(4):455-481.
"At the request of agricultural commissioners, surveys were made to determine insects most destructive to cotton. Most of the damage was caused by sucking insects. The cotton dauber, *Lygus elisus*, was the most numerous. Leaf injury was noted from both the variegated cutworm, *Lycophotia margaritosa*, and cotton leaf perforator, *Bucculatrix thurberiella*. The cutworm was responsible for most of the damage noted." (473)

Mackie, D. B. 1941. Division of plant industry. Bureau of entomology and plant quarantine. Calif. Dep. Agr. Bull. 30(4):337-384.
Dominant among the different species of cutworms appearing over widespread areas in five counties in California was the variegated cutworm. In 1940, young stands of alfalfa, citrus, sugar beets, and vetch were hit hardest by this pest. Calcium arsenate and cryolite dusts were used with success. (347)

Mackie, D. B. 1942. Division of plant industry. Bureau of Entomology and Plant Quarantine. Calif. Dep. Agr. Bull. 31(4):163-198.
"Cutworms of various kinds, particularly the variegated cutworm, caused losses to a wide variety of crops including tomatoes, celery, cabbage, sugar beets, mustard, potatoes, grain, alfalfa, and grapes. Losses traceable to this species extend from Imperial to Siskiyou counties." (171)

MacNay, C. G. 1947. A summary of the more important insect infestations and occurrences in Canada in 1946. 77th Annu. Rep. Entomol. Soc. Ont. 1946:1-67.
In Prince Edward Island, *Peridroma margaritosa* (Haw.) was less prevalent than usual, causing minor damage in gardens. (47)

MacNay, C. G. 1948. A summary of the more important insect infestations and occurrences in Canada in 1947. 78th Annu. Rep. Entomol. Soc. Ont. 1947:1-95.
The variegated cutworm, *Peridroma margaritosa* (Haw.), usually the most common species, did not seem to be particularly abundant in 1947. (71)

Marcovitch, S. and W. W. Stanley. 1937. Cutworms. Tenn. Agr. Exp. Sta. Bull. 160: 1-14.
Cutworms are discussed as pests of tobacco in Tennessee. Formulae are given for preparing poisoned baits for cutworm control. An egg mass of the cutworm, *Lycophotia margaritosa*, is illustrated in Fig. 15. (11)

Marcovitch, S. and W. W. Stanley. 1945. Entomology. Sweetpotato insects. Tenn. Agr. Exp. Sta. Annu. Rep. 58:1-155.
"In Middle Tennessee, centered chiefly in Williamson County, the armyworm and, to some extent, the variegated worm, caused considerable damage in May. The infested fields as a rule were those of crimson clover with barley or wheat. The variegated worm usually was found in alfalfa fields." (115)

Marten, J. 1880. Noctuidae (Owlet moths). Ill. Dep. Agr. Trans. 18 Append.:128-140.
Agrotis saucia Hüb. (the unarmed rustic) is the larva called the variegated cutworm which hatches from a pink-colored egg with ribs radiating from the center. This is one of the most voracious of the cutworms. They are indiscriminate feeders. (134-135)

Martignoni, M. E. 1952. Die submikroskopische textur der peritrophischen membran von *Peridroma margaritosa*. Mitt. Schweiz. Entomol. Gesellschaft, 25(2):107-110. (In German, English summary.)
"Summary. The submicroscopic texture of the peritrophic membrane of a noctuid larva is described. Instead of examining whole membranes which in this insect are too thick for the passage of the electron beam, the author studied individual layers of the peritrophic membrane. The existence of a disordered framework with distinct micelles is shown. This texture is different from the textures observed by other authors. The possibility is suggested that individual layers of the peritrophic membrane of *Bombyx mori* as described by Huber (1950) might show, if properly shadowed, a texture similar to the above." (110)

Martignoni, M. E. 1964. Progressive nucleopolyhedrosis in adults of *Peridroma saucia* (Hübner). J. Insect Path. 6:368-372.
"It is known that larvae and pupae of Lepidoptera are susceptible to nucleopolyhedrosis virus. The results presented in this paper show that the disease can also be produced experimentally in adults of *Peridroma saucia* (Hübner), a noctuid moth. The typical cytopathic changes of nucleopolyhedrosis have been observed in the fat body, tracheal matrix, and epidermis of the adults. The life span of the diseased adults is considerably shorter than that of healthy moths." (368)

Martignoni, M. E. and J. E. Milstead. 1964. Hypoproteinemia in a noctuid larva during the course of nucleopolyhedrosis. J. Insect Path., 6(4):517-531.
This study provides informational changes in total solids and total proteins occurring in the blood plasma of larvae of the variegated cutworm, *Peridroma saucia* Hübner, during the course of a viral disease.

Martignoni, M. E. and J. E. Milstead. 1965. Hypoproteinemia in a noctuid larva during the course of nucleopolyhedrosis. Proc. XII Int. Cong. Entomol., London, 12:1-842.
"The data presented indicate that hypoproteinemia is definitely a part of the nucleopolyhedrosis syndrome in larvae of *P. saucia* and possibly, because of the role of the fat body in blood-protein synthesis, of other Lepidoptera. We have observed repeatedly that hypoproteinemia is most pronounced when the severity of cytopathic changes in the fat body is greatest. Thus the refractive index of the blood plasma has not only a diagnostic value but, at least in the case of larvae of *P. saucia*, it may also serve to quantify the extent of the lesions in one of the target tissues." (746-747)

Martignoni, M. E. and J. E. Milstead. 1966. Hypoproteinemia in a noctuid larva during the course of a granulosis. J. Invert. Path., 8(2):261-263.
"In a recent paper (J. Insect Pathol., 6, 517-531, 1964), we reported on the occurrence of pronounced total solids and total protein deficits in the blood plasma of sixth instar larvae of *Peridroma saucia*, the variegated cutworm, during the course of nucleopolyhedrosis. We have now completed a similar study of larvae inoculated with granulosis virus. For larvae of *P. saucia*, this virus is monorganotropic, the fat body being the primary target tissue, whereas nucleopolyhedrosis affects the tracheal matrix, the epidermis, as well as the fat body. In both cases, the fat body, which appears to be the main site of blood-protein synthesis in lepidopteran larvae, is a target tissue." (261)

Martignoni, M. E. and J. E. Milstead. 1967. Glutamate-aspartate transaminase activity in the blood plasma of an insect during the course of two viral diseases. Ann. Entomol. Soc. Amer., 60(2):428-431.

"Glutamate-aspartate transaminase was assayed in the blood plasma of the noctuid larva *Peridroma saucia* (Hübner) during the course of the nucleopolyhedrosis and granulosis. The blood plasma transaminase activity was measured in LaDue-Wróblewski-Karmen units. In larvae with nucleopolyhedrosis, the activity of this enzyme was significantly elevated at the fourth and subsequent days after peroral inoculation with the virus. During the course of granulosis, the elevation was less marked; the first statistically significant increase was detected only at the fifth day postinoculation. These differences in hyperenzymemia appear to be the result of dissimilar cytocidal activities of the two viruses concerned." (428)

Martignoni, M. E., E. M. Zitcer, and R. P. Wagner. 1958. Preparation of cell suspensions from insect tissues for *in vitro* cultivation. Science, 128:360-361.
The variegated cutworm is readily available in the San Francisco Bay area and is easily raised in the laboratory. The integument of the thoracic segments of the fifth instar larva was used for the present study. It is comprised of differentiated larval cells and undifferentiated cells in the wing buds and leucopoietic organs. This method for preparing cell suspensions from insect tissue is reproducible and makes possible quantitative studies involving large numbers of cells.

Mayer, E. L., R. H. Nelson, C. E. Robertson, and J. J. Willaman. 1951. Nicotine insecticides. Part VI. Search for synergists (continued). U. S. Dep. Agr. Bur. Entomol. and Plant Quar., E-833:1-5, 11.
"The search for compounds to replace some of the nicotine in insecticides and thereby make its use more economical has been continued. This paper presents the results of developmental laboratory work on adjuncts which appeared promising in preliminary screening tests reported in Part V of this series (E-768)." (1)

Mayer, E. L., E. R. McGovran, F. B. Talley, C. R. Smith, D. H. Saunders, and C. F. Woodward. 1949. Nicotine insecticides. Part V. Search for synergists. U.S. Dep. Agr., Bur. Entomol. and Plant. Quar., E-768:1-16.
This paper is the fifth in a series reporting investigations on nicotine insecticides. In Part II an effort was made to find compounds which might replace part of the nicotine to stretch the limited supply of this insecticide and thereby make its use more economical. This paper is a continuation of such studies and presents results obtained with 107 additional materials. As before, all mixtures were prepared at the Eastern Regional Research Laboratory of the Bureau of Agricultural and Industrial Chemistry and tested against plant-feeding insects at the Sanford, Fla., and Anaheim, Calif., laboratories of the Bureau of Entomology and Plant Quarantine. (1)

McDaniel, E. I. 1931. Insect and allied pests of plants grown under glass. Mich. Agr. Exp. Sta., Spec. Bull. 214:1-117.
"Variegated cutworm, *Lycophotia margaritosa* Haw. The variegated cutworm is found almost the world over. It is a general feeder often found on asparagus, carnation, chrysanthemum, nasturtium, pansy, rose, *Smilax*, sweet pea, and violet. Moths appear outdoors in May and June and again in August and September. Under glass, they may be present the year-round. The pale grey or dull brown larvae reach the size of about 2 inches in length. There is a yellowish band along each side. During the night the larvae climb the stems of carnations and chrysanthemums, where they eat out the unopened buds. They often clip the stem just beneath the surface of the soil" (78)

McDunnough, J. H. 1928. A generic revision of North American agrotid moths. Can. Nat. Mus. Bull. 55:1-78.
The moth of *Peridroma margaritosa* Haworth is described. The male genetalia are described and illustrated. (46-47)

McDunnough, J. 1938. Check list of the lepidoptera of Canada and the United States of America. Part I. Macrolepidoptera. Mem. South. Calif. Acad. Sci. 275 pp.
"*Peridroma* Hbn.
1496 *margaritosa* Haw.
inermis Harr.
form *saucia* Hbn." (64)

Meisner, J. 1964. Laboratory trials of insecticides against larvae of Noctuidae. (He) Rehovot. Nat. and Univ. Inst. Agr., Spec. Bull. 63:1-22.
In an insecticidal screening of organic phosphates on *Cirphis unipuncta* and *Peridroma margaritosa* larvae, the concentrations used were: 0.05, 0.1, 0.2, and 0.4% active ingredient. Against larvae of *Peridroma margaritosa*, only diazinon, of the organophosphors, gave good results at all concentrations. The chlorinated hydrocarbons and Zectran were less efficient. Of the combinations tested, diazinon-Rogor and endrin-phosphamidon were effective at all concentrations.

Merrill, L. G. and B. B. Pepper. 1956. Insects of asparagus and solanaceous crops. N. J. Ext. Bull. 295:1-14.
The distribution, description, importance, life history, and food habits of the variegated cutworm are discussed. (13) The larva, egg cluster, single egg, and adult moth are figured.

Metcalf, C. L. 1921. A contribution toward the control of *Peridroma saucia* as a tomato fruit worm. J. Econ. Entomol., 14:94.
The title paper was withdrawn for publication elsewhere and this paper deals with a conversation between Dr. George Dean and Dr. C. L. Metcalf about ways of controlling the variegated cutworm on alfalfa. There were three rather serious outbreaks of variegated cutworm in Kansas in 1909, 1914, and 1919.

Metcalf, C. L., W. P. Flint, and R. L. Metcalf. 1962. Destructive and useful insects, their habits and control. McGraw-Hill Book Co., Inc., N. Y. Fourth Ed. 1,087 pp.
The importance and type of injury, life history, appearance, habits, and control measures for cutworms in general are discussed. The variegated cutworm, *Peridroma saucia*, overwinters as a pupa. (594-596)

Metcalf, H. 1907. The principal injurious insects of the year 1907. U. S. Dep. Agr. Yearbook:541-552.
"Cutworms, always the subject of much complaint, were more numerous than in most years. Of the variegated cutworm (*Peridroma margaritosa* Haw. [*saucia* Hbn.]), the year 1907 witnessed a moderately severe outbreak in many portions of the country. The insects were very abundant in Maryland, Virginia, District of Columbia, California, Texas, Arizona, Missouri, Tennessee, Indiana, Illinois, Washington, Ohio, New York, Pennsylvania, Massachusetts, Vermont, and West Virginia, attacking practically all forms of truck crops and ornamental plants and also injuring crops such as onion, tobacco in Tennessee, clover in Indiana, etc." (545)

Metcalf, H. 1908. The principal injurious insects of the year 1908. U. S. Dep. Agr. Yearbook:567-580.

"Cutworms were more injurious locally than in some seasons but no widespread outbreaks were reported. The variegated cutworm (*Peridroma margaritosa* Haw.) was moderately abundant in portions of Virginia and Texas." (573)

Mickle, G. T. and J. H. Newton. 1951. Fruit pests: their control in Colorado. Colo. Ext. Bull. 416-A:22.
The variegated cutworm is one of the climbing cutworms which attack fruit crops in Colorado.

Middleton, M. S. 1913. Cutworms and their control. Proc. Entomol. Soc. British Columbia, n. s. 3:36-37.
This describes control methods for *Peridroma saucia* and other cutworms, including poison bait, tanglefoot, banding with cotton batten, chickens, cultivation, and destruction of cover crops. (37)

Milliron, H. E. 1958. Economic insect and allied pests of Delaware. Univ. Del. Agr. Exp. Sta. Bull. 321:1-87.
"*Peridroma margaritosa* (Haw.). Variegated Cutworm. Larvae numerous in Kent County fields, late May and early June 1953, 1954, and 1956; damage to foliage difficult to appraise." It is considered to be a minor pest of alfalfa. (9) The variegated cutworm is a minor pest of clover throughout Delaware. The larvae are conspicuous everywhere in clover fields. They were observed from mid-May to mid-June in 1955. The injury was not apparent. (20) *Peridroma margaritosa* is a minor pest to the corn crop throughout Delaware. Light damage was observed once on sweet corn in late June 1951 in Kent County. (25) It is a minor pest of peas. Small to fully grown larvae were common in one commercial acreage in eastern Sussex County in early June in 1955. (49) The variegated cutworm is a minor pest of peppers. It is generally distributed over the state. The larvae caused some damage in Kent and Sussex counties in 1952. (51)

Milstead, J. E. 1968. Changes in weight and hemolymph total solids resulting from starvation in the sixth instar of *Peridroma saucia* and *Pseudaletia unipuncta* (Lepidoptera:Noctuidae). J. Invert. Path., 10(1):306-312.
Food and water deprivation during the active feeding phase results in an initial rise in the concentration of total solids in the plasma of summer laboratory generations of sixth instar larvae of *Peridroma saucia* and *Pseudaletia unipuncta* reared at a constant temperature of 25° C. It is felt that this change is a characteristic symptom associated with starvation in these species. (306)

Milstead, J. E., M. E. Martignoni, and M. A. Johnson. 1967. Developmental changes in weight and hemolymph total solids in the sixth instar of *Peridroma saucia* (Lepidoptera:Noctuidae). Ann. Entomol. Soc. Amer., 60(3):702-705.
"In spring and winter generations of the variegated cutworm, *Peridroma saucia* (Hübner), female larvae are heaviest at the fourth day after the fifth ecdysis, their weight decreasing subsequently, but in summer generations their weight continues to increase until the sixth day. Spring and winter males show weight changes similar to those of females of the same generations, but the summer males, in contrast, maintain a constant weight from the fourth to the sixth day after ecdysis. The data obtained in this study suggest that, as a gauge of larval age in populations of healthy insects, plasma refractive index measurements may be more reliable than measurements of wet weight." (702)

Montgomery, B. E. 1933. Preliminary studies of insect parasites in Indiana. Can. Entomol. 65:185-190.

"1490. *Lycophotia saucia* Hbn. Early in June 1931, cutworms were abundant in sweet clover in an apple orchard near Orleans, where codling moth experiments were being conducted. A number of cutworms of varying sizes, most of them showing signs of parasitism, were collected June 10. A moth emerged in this cage June 30, and the following parasites appeared between June 22 and July 7: *Rogas terminalis* (Cress.)--1, *Winthemia rufopicta* Big.--8, *Archytas apicifera* Walk.--2. Subsequently four specimens of *Apanteles xylinus* (Say), one specimen of *Microplitis feltiae* Mues. and three specimens of *Voria ruralis* Fallen emerged from parasitized larvae. (186)

Moore, S. 1955. An annotated list of the moths of Michigan exclusive of Tineoidea (Lepidoptera). Univ. Mich. Misc. Pub. 88:1-87.
Michigan County records for *Lycophotia margaritosa* are given. (18)

Morgan, A. C. 1910. Methods of controlling tobacco insects. U. S. Dep. Agr. Circ. 123:1-3.
Tobacco is frequently very seriously injured by various species of cutworms, one of which is the variegated cutworm. Where tobacco follows clover, serious injury from these pests is likely to result. Some control methods are discussed. The egg, larva, and moth are figured. (2)

Morgan, A. C. 1910. Insect enemies of tobacco in the United States. U. S. Dep. Agr. Yearbook for 1910:281-296.
Peridroma margaritosa cutworms are serious pests of tobacco. The moth, larva, and egg of the variegated cutworm are figured. (283-284)

Morrill, A. W. 1913. Entomological pioneering in Arizona. J. Econ. Entomol., 6(2):185-195.
The corn earworm, codling moth, alfalfa butterfly, and the variegated cutworm (which also attacks alfalfa) were, in the order named, the leading lepidopterous pests in Arizona from 1909 to 1913. (192)

Morrill, A. W. 1919. The value of molasses and syrups in poisoned bait for grasshoppers and cutworms. J. Econ. Entomol. 12:337-343.
"Prof. G. A. Dean of Kansas reported that unsatisfactory results believed to be due to the omission of molasses or syrup had been noted particularly in work against the variegated cutworm (*Peridroma margaritosa*). He also reported having observed no difference in results against grasshoppers with baits containing blackstrap molasses as compared with other grades of molasses or syrups. Professor Dean's results referred particularly to *Melanoplus differentialis, M. bivittatus,* and *Peridroma margaritosa.*" (341) "Early in May of the present year, a severe outbreak of variegated cutworms (*Lycophotia* (*Peridroma*) *saucia* Hbn.) occurred in alfalfa fields near Gilbert, Arizona. In one instance an 80-acre field was severely damaged. In fact, all growth was prevented until the cause was discovered and the remedy applied." (342)

Morrill, A. W. 1920. The Arizona commission of agriculture and horticulture tenth annual report for 1918:55-56.
"Cutworms have been very destructive as in previous years. Inspector W. B. Eagar, in his report for August, stated that certain cutworms, since determined by S. E. Crumb as variegated cutworms (*Lycophotia* (*Peridroma*) *saucia* Hbn.), were present in two-thirds of the fields in the Eagar-Springerville section and that the damage in these fields ranged from 25 to 75 percent. Alfalfa was also attacked to a considerable extent. Mr. Eagar reported good results from the use of poisoned baits." The egg, larva, and moth of the variegated cutworm are figured. (56)

Morrison, H. K. 1874. List of a collection of Texan Noctuidae with descriptions of the new species. Proc. Boston Soc. Nat. Hist., 17:209-221.
"*Agrotis saucia* Hübn. Three specimens, March 13, May 26, and June 22. *Agrotis ortonii* Pack. from the Upper Amazon is identical with this species, which is distributed over both North and South America as well as Europe." (210)

Muma, M. H. 1946. Insects injurious to corn in Nebraska. Neb. Ext. Circ. 1537:1-20.
The variegated cutworm is one of the cutworms which injures corn in Nebraska. (17)

Neary, M. E. 1944. Entomological Division. Nova Scotia Dep. Agr. Rep. for 1943: 145-152.
"The variegated cutworm, *Peridroma margaritosa* (Haw.) caused serious damage to seedling tomato and flowering carnation plants growing in one of the greenhouses in Annapolis Valley, resulting in an estimated $300 loss before control measures abruptly stopped the insect doing further damage." (146)

Neary, M. E. 1947. Entomology Division. Rep. Dep. Agr. and Mark., Nova Scotia, for year ending Nov. 30, 1946:90-95.
The variegated cutworm was reported from a few provincial points as causing light to moderate injury in gardens. In Pictou Co., it was present in some canning pea fields. (91)

Neary, M. E. 1948. Entomology Division. Dep. Agr. and Mark., Prov. Nova Scotia, for year ending Nov. 30, 1947:138-143.
"The variegated cutworm, *Peridroma margaritosa* (Haw.), again caused considerable damage to garden crops in some localities of the province." (139)

Neilson, C. L. 1952. Report of the provincial entomologist. Brit. Col. Dep. Agr. Rep. 46:Y53-Y61.
The cutworm outbreak of 1951 was widespread and severe and much damage occurred throughout practically every section of the province. Fulton of Agassiz reported severe damage to sugarbeet seedlings in the Ladner area by *Peridroma margaritosa*. (Y55)

Newell, W. 1908. Some common insects injurious to truck crops. Proc. Fifth Annu. Meet., La. State Hort. Soc.:51-53.
A general description of cutworm appearance and habits is given. Methods of cutworm control are discussed. The egg, larva, and moth of *Peridroma saucia* are figured.

Newman, E. 1849. Illustrated natural history of British moths. W. Tweedie Publishers, London. 486 pp.
The moth and larva of the "pearly underwing" (*Agrotis saucia*) are described. Two varieties and one form of the moths are illustrated. (319-320)

Nielsen, A. 1950. Noctuidefangst pa Honningdogg. Norsk Entomologisk. Tidsskr. B. 8(1-3):126-128.
An unusual collecting technique was developed in which noctuid moths (including *Agrotis saucia*) were collected at night from an elderberry hedge heavily infested with aphids. From 500 to 1,000 moths could be collected each night and the moths were attracted to the honeydew.

Oatman, E. R. 1958 Variegated cutworm (*Peridroma margaritosa*) injury to ripe strawberries. J. Econ. Entomol., 51(3):410-411.

The variegated cutworm was found causing injury to strawberries in the vicinity of Sturgeon Bay, Wis. The cutworm and feeding injury on strawberry are figured.

Oatman, E. R. and G. R. Platner. 1972. An ecological study of Lepidopterous pests affecting lettuce in coastal southern California. Environ. Entomol., 1(2): 202-204.
Eight lepidopterous larvae were collected from the lettuce crop in southern California. The variegated cutworm was one of three cutworms involved. (204)

O'Kane, W. C. 1912. Injurious insects. How to recognize and control them. Macmillan Co., N. Y. 414 pp.
The larva and moth of the variegated cutworm, *Peridroma margaritosa*, are figured (328) This species was considered representative of the climbing cutworms. Paris green or lead arsenate were recommended for control. (329)

Okumura, G. T. 1959. Illustrated key to the lepidopterous larvae attacking lawns in California. Calif. Dep. Agr. Bull. 48:1-36.
This key is designed for the identification of fully grown or nearly fully grown larvae. It is a technical key which requires a stereo-microscope and advanced knowledge of larval morphology.

Okumura, G. T. 1961. Lepidopterous larvae attacking cotton. Calif. Dep. Agr., Spec. Pub. 282:1-80.
This key is designated for the identification of fully grown or nearly fully grown larvae attacking cotton. It is a technical key which requires advanced knowledge of larval morphology and a stereo-microscope.

Okumura, G. T. 1974. Illustrated key to the identification of lepidopterous larvae attacking tomatoes in Mexico and the United States excluding Alaska. Nat. Pest Control. Oper. News, 34(7):13-18.
Peridroma saucia is included in this key to tomato pests. The key is designed for the identification of fully grown or nearly fully grown larvae which attack tomatoes in Mexico and the U. S. excluding Alaska. It is a technical key which requires advanced knowledge of larval morphology and a stereo-microscope. The illustration of the variegated cutworm is somewhat misleading as far as appearance is concerned.

Packard, A. S. 1869. Appendix to the report on articulates. First Rep. Peabody Acad. Sci.:56-69.
The author described *Agrotis ortonii* as a new species. Later *ortonii* was considered synonomous with *Peridroma saucia*. (65)

Padilla, R. C. 1952. Aldrin y dieldrin. Dos neuvos insecticidas orgánicos de grandes perspectivas para la protección de huestra agricultura. Fitofilo 6: 25-48.
The potential of two new organic insecticides, aldrin and dieldrin, for crop protection in Mexico is discussed. The recommendations for variegated cutworm control include the use of a 2.5% aldrin dust at the rate of 39 to 40 kg. per hectare.

Painter, R. H. 1955. Insects on corn and teosinte in Guatemala. J. Econ. Entomol., 48:36-42.
Peridroma margaritosa (Haw.). (Det. E. L. Todd.) One specimen of the variegated cutworm emerged from a pupa collected from soil under a corn hill, Antigua, August 8, 1952. (40)

Painter, R. H., H. R. Bryson, and D. A. Wilbur. 1954. Insects and mites that attack wheat in Kansas. Kans. Agr. Exp. Sta. Bull. 367:1-46.
Variegated cutworms are grayish-brown, with a pale-yellow dot on the top of the first seven body segments. A conspicuous dark W is often present on the eighth abdominal segment. Life stages and injury are described and control measures for the variegated cutworm are discussed.

Palm, C. E. and W. D. Wylie. 1941. Biology and control of cutworms. Annu. Rep. Cornell Agr. Exp. Sta. 54:1-202.
"Laboratory tests with various bait formulas were made this year. The larvae of *Leucania unipuncta*, *Agrotis ypsilon*, *Peridroma margaritosa*, *Graphiphora c-nigrum*, and *Feltia ducens* were used as test animals. As a result of these tests, it was concluded that sodium fluosilicate, 2 or 3 lb. to 100 lb. of bran, made the most efficient bait, with sodium arsenite, white arsenic, and Paris green next in effectiveness, in the order given. Lead and calcium arsenate were unsatisfactory. Use of blackstrap molasses in the bait is desirable. Results obtained with a pre-mixed cutworm bait in various parts of the state in 1940 were highly satisfactory; this bait is being produced commercially in 1941." (130)

Parker, F. D. and R. E. Pinnell. 1971. Overwintering of some *Trichogramma* spp. in Missouri. J. Econ. Entomol. 64(1):80-81.
"*Trichogramma evanescens* Westwood overwintered in eggs of the imported cabbageworm, *Pieris rapae* (L). The parasite entered diapause in late October and emergence was synchronized with the host in early spring. *T. minutum* Riley overwintered in eggs of the variegated cutworm, *Peridroma saucia* (Hübner), but some parasites emerged during warm periods in the winter." (80)

Pastrana, J. A. 1968. Larvae that attack the ears of corn. Hoja Inf. Inst. Patol. Veg. 24:1-2.
This is a mimeographed information sheet describing insect larvae which attack corn ears, including *Peridroma saucia*.

Peairs, L. M. 1946. Insect pests of farm, garden and orchard. John Wiley & Sons, Inc., N. Y. 549 pp.
The variegated cutworm deserves special mention as a pest of tobacco, alfalfa, and other field and garden crops. In Tennessee, where this insect injures tobacco in the seedbed and in the field, it is said to produce four generations and to winter as a pupa. In Kansas, where alfalfa may suffer severely from its attacks, it produces only a partial second generation and larvae, pupae and adults may hibernate. Poisoned baits are used for control. (112) (The authors doubt that the variegated cutworm has only one and a partial second generation in Kansas, since it has three generations in northern Ohio.)

Pease, S. A. 1908. Controlling the armyworm. Calif. Cult. 3:414.
"The cutworm is hatched from eggs laid by moths. These moths in Southern California are *Agrotis saucia* and *Peridroma saucia*; there may be others but of these two I am sure. The moths are quite dark-colored and about one and one-half inches across and may be seen in the twilight flitting over the flowers and shrubbery. Usually the moths lay their eggs in the month of March and the cutworms appear in April. They are quite easily controlled in the orchard but it is a much harder matter to do anything with them in the alfalfa fields as it is not possible to keep them off the alfalfa and if you spray the grass it would not be fit to feed stock." Methods of controlling cutworms are discussed.

Perkins, G. H. 1894. Cutworms. Seventh Annu. Rep., Vt. Agr. Exp. Sta.:135-141.
The variegated cutworm is one of the common cutworms found in Vermont. The egg, larva, and moth of *Peridroma saucia* are described and figured. (139-140)

Pfrimmer, T. R. 1957. Response of insects to different sources of black light. J. Econ. Entomol. 50:801-803.
Three types of light traps were operated to determine which was most attractive to certain species of moths. A 100-watt mercury vapor attracted 82 (49% female) *Peridroma saucia* in 1955 and 69 (51% female) in 1956. A 15-watt BL lamp attracted 424 (50% female) in 1955 and 329 (56% female) in 1956. A 15-watt BL lamp attracted 222 (48% female) in 1955 and 352 (58% female) in 1956.

Phipps, C. R. 1931. Blueberry and huckleberry insects. Maine Agr. Exp. Sta. Bull. 356:107-232.
The food plants, seasonal history, importance, description of stages, and host range of the variegated cutworm, *Lycophotia margaritosa*, are discussed. (165-166)

Pierce, F. N. 1967. The genitalia of the group Noctuidae of the Lepidoptera. Middlesex, Eng. 273 pp.
The male genetalia of *saucia* are described and figured.

Pierce, W. D. 1917. How insects affect the cotton plant and means of combating them. U. S. Dep. Agr., Farmers' Bull. 890:1-27.
Lycophotia margaritosa was considered a pest of cotton. A single system for cotton control is described and the measures for each season are indicated. In early spring, poison bait traps are set for cutworms.

Pierstorff, A. L. and T. H. Parks. 1931. Plant disease and insect notes. Cutworms. Ohio Ext. Serv. Pl. Dis. and Insect Notes, 2(2):1-4.
"The variegated cutworm, *Peridroma margaritosa* Haw., has the habit of feeding above ground on leaves of vegetables and frequently bores into fruits of tomatoes in the same manner as the corn earworm. This larva looks much like the corn earworm and has often been mistaken for it." (2)

Poitout, S. and R. Bues. 1969. La consanguinité chez les lépitoptères *Noctuidae*. Mise en évidence de son importance dans la conduite d'élevages en conditions artificielles. Ann. Zool. Ecol. Anim., 1(3):245-264.
By ensuring that strict inbreeding (crosses between siblings) could not take place, it was possible during rearing on an artificial medium in the laboratory in France to obtain 14 successive generations of corn earworm (instead of 3), 10 of spotted cutworm (instead of 5), and 28 of beet armyworm (instead of 2). Similar results were obtained with variegated cutworms.

Pritchard, A. E. 1949. California greenhouse pests and their control. Calif. Agr. Exp. Sta. Bull. 713:1-72.
"Variegated cutworm, *Peridroma margaritosa* (Haw.) is one of the important greenhouse cutworm species. Caterpillar is gray or brown with darker markings and with a row of yellow dots down the middle of the back. It is a common pest throughout California, often entering greenhouses to feed on young gardenias, carnations, and many other flowering plants." (35-36)

Puttler, B. 1961. Biology of *Hyposoter exiguae* (Hymenoptera:Ichneumonidae), a parasite of Lepidopterous larvae. Ann. Entomol. Soc. Amer., 54(1):25-30.

Hyposoter exiguae (Viereck) is a nearctic ichneumonid and a solitary endoparasite of the larvae of several species of cutworms, including the variegated cutworm, beet armyworm, tomato fruitworm, and alfalfa caterpillar. (25)

Puttler, B. and S. E. Thewke. 1970. Biology of *Microplitis feltiae* (Hymenoptera: Braconidae), a parasite of the black cutworm, *Agrotis ipsilon*. Ann. Entomol. Soc. Amer., 63(3):645-648.
The braconid *Microplitis feltiae* Muesebeck is widely distributed in the United States as a parasite of soil-inhabiting cutworms. The recorded hosts are the variegated cutworm, bristly cutworm, dingy cutworm, black cutworm, clay-backed cutworm, and granulate cutworm. (645)

Rabb, R. L., H. E. Scott, F. E. Guthrie, and C. F. Smith. 1959. Tobacco insects of North Carolina and their natural enemies. N. C. State Coll. Agr. Exp. Sta. Bull. 394 rev.:1-32.
The variegated cutworm is one of the three most important cutworms attacking tobacco in North Carolina. (9)

Randolph, N. M. 1956. Control of insects affecting vetch seed production. J. Econ. Entomol., 49(3):403-404.
Three insecticidal sprays, malathion, parathion, and toxaphene-DDT, were applied to vetch near Terrell, Texas, in 1955 for the control of insects. The chief injurious insects were the pea aphid and certain species of armyworms and cutworms (including variegated cutworm). Each of the three insecticides controlled pea aphids, but toxaphene-DDT gave the best control of aphids, armyworms, and cutworms.

Razowski, J. and E. Palik. 1972. The lepidopterous fauna of the Cracow vicinity. Acta. Zool. Cracoviensia 10:117-217.
"*Peridroma margaritosa* (Haw.) (=*saucia* Hbn.). Not numerous and local. Collected in lichenaceous-shrub biotypes. Cracow (Poland) on August 5 (Nies.) and on July 12, 1933 (Pal.), Podgorki on Sept. 25, 1954 (Pal.), Sanka on Sept. 14 and Nov. 1 1954 (Chmiel)." (186)

Rebel, H. 1904. Studien über die lepidopteran fauna der Balkanländer. (Studies of the lepidopteran fauna of the Balkans.) Ann. K. K. Naturhist. Hofmus. Wien. 19:97-377.
The author reported *P. saucia* abundant and widespread throughout the Balkans. He reported the recorded geographical distribution in the Balkans. (211)

Reed, W. V. 1915. Some of the more important truck crop pests in Georgia. Cutworms. Ga. State Bd. Entomol. Bull. 41:1-39.
The cutworms, *Lycophotia margaritosa* (*Peridroma saucia*) and *A. ypsilon*, can be controlled in Georgia by clean cultivation and the use of poisoned baits.

Reid, W. J. and F. P. Cuthbert, Jr. 1957. Control of caterpillars on commercial cabbage and other cole crops in the South. U. S. Dep. Agr. Farmers Bull. 2099:1-24.
The variegated cutworm is one of several species of cutworms attacking cabbage and related crops in the South. (8)

Reynolds, H. T., V. M. Stern, T. R. Fukuto, and G. D. Peterson, Jr. 1960. Potential use of Dylox and other insecticides in a control program for field crop pests in California. J. Econ. Entomol., 53(1):72-78.

"Dylox (0,0-dimethyl 2,2,2-trichloro-1-hydroxyethylphosphonate) and several standard insecticides were evaluated for effectiveness on a rather wide range of insects damaging field crops in California. At varying dosages Dylox was effective in controlling the following pests on alfalfa hay: alfalfa caterpillar, *Colias philodice eurytheme* Bdv.; webworm, *Loxostege* spp.; beet armyworm, *Laphygma exigua* (Hbn.); and variegated cutworm, *Peridroma margaritosa* (Haw.)." (72)

Riley, C. V. 1869. Cutworms. The natural history of 12 distinct species. First Rep. Noxious, Beneficial, and Other Insects Mo.:67-91.
Variegated cutworm larvae were reported damaging grapevines in cold frames. Eggs of this species were found on a cherry twig and on a white mulberry leaf. Eggs reared to the adult stage required 35 days. Other hosts reported were lettuce and cabbage. Synonyms of *P. saucia* were *Agrotis saucia* Treitschke and *Agrotis inermis* Harris. (72-74)

Riley, C. V. 1884. Report of the entomologist. Rep. Comm. Agr. for 1884:285-418.
The egg, larva, pupa, and moth of the variegated cutworm *Agrotis saucia* are described. (297-298)

Rings, R. W., R. K. Lindquist, F. J. Arnold, and G. J. Musick. 1973. Comparative effectiveness of Mesurol and Sevin baits for control of black and variegated cutworms. Pest. News, 26(3):62-66.
Mesurol and Sevin baits were more effective against the variegated cutworm than the black cutworm. Both baits were equally effective in protecting tomato seedlings and in producing cutworm mortality. Neither bait was effective in protecting seedling corn from sixth instar black cutworms. The symptoms of Mensurol poisoning in both cutworms were cessation of feeding, difficulty in walking, regurgitation of the pellets, convulsions, and paralysis. Similar symptoms were observed in the case of Sevin poisoning but convulsive movements were more severe. Affected larvae lay paralyzed on their side with their mandibles moving rapidly and with the hindgut protruding as a result of severe abdominal muscle spasms.

Riquelme-Inda, J. 1927. Plaga y enfermedades del garbanzo. Memorias de la Sociedad Alzate 47:43-53.
Several species of caterpillars attack garbanzos in Mexico. The most common species are *Peridroma saucia* (Hbn.) and *Heliothis obsoleta* (Haw.). Control consists of spraying with 1 kilo of lead arsenate in 100 liters of water. (45)

Rivnay, E. 1963. Present status of Lepidopterous pests of maize and other gramineous crops in Israel. F.A.O. Plant Prot. Bull. 11(1):1-3.
The variegated cutworm causes damage to summer cereal crops such as corn in Israel.

Rivnay, E. and S. Yathom. 1964. Phenology of Agrotinae in Israel. Z. Angew. Entomol., 55(2):136-152.
"*R. margaritosa* is distributed in the new and old worlds. While in the new world its distribution is as far south as Argentina, in the old world its southernmost record is in the Canary Islands. There are many records of damage by caterpillars of this species; most of them are from America with only about 5% from European countries." (143)

Roark, R. C. 1944. A review of the insecticidal uses of rotenone and rotenoids from derris, *Lonchocarpus* (cube and timbo), tephrosia, and related plants. Part VII: Lepidoptera. U. S. Dep. Agr., Bur. Entomol. and Plant Quar. E-625:1-226.

"Washburn (472) in 1934 reported that derris was ineffective as a stomach poison to last instars of (*Lycophotia*) *Peridroma margaritosa*. Kale leaves were dusted and made into sandwiches, so there would be no contact between the dust and the bodies of the larvae. Thirty larvae were fed sandwiches of 10% ground derris dust (6% rotenone) in diatomaceous earth with no ill effects whatever; 30 larvae were fed pure ground derris dust (6% rotenone) with no ill effects; 30 fourth instars were fed derris dust (6% rotenone) with no ill effects; 20 fourth instars were put on leaves freshly dusted with pure derris dust and showed no ill effects. The only effect noted was that the derris seemed to be somewhat repellent, as the larvae did not eat so freely of the treated material as they did of the untreated." (93)

Robinson, R. R. 1974. Insects of peas. Pacific Northwest Coop. Ext. Pub. 150:1-19.
"Variegated Cutworms. Caterpillars are ashy or a light, dirty brown color, lightly mottled with darker brown. Four to six yellow spots along the middle of the back distinguish this cutworm from others. The underside is light gray. Moths' front wings are brownish, somewhat spotted gray. Hind wings are pearly white with brown veins and margins. The tiny young caterpillars are active during the day. They crawl up plants with a looping gait to feed on terminal leaves and buds. Older larvae feed only at night and spend the daytime under clods. When numerous they can be very destructive." (4)

Rock, G. C. and H. L. Waynick. 1975. Infestation of apple by the variegated cutworm. J. Econ. Entomol. 68(2):277.
Variegated cutworms assumed the climbing habit in late August in Burke County, N. C. As a result of their nocturnal feeding, about 50% of the fruit in a 50-acre apple orchard was damaged. This is the first report of injury to apple by this species in the eastern United States.

Rockwood, L. P. 1926. Alfalfa and clover insects in the North Pacific region. Columbia Port Digest, 4(4):8-9.
The variegated cutworm is probably the worst of the occasional depredators of alfalfa and clover in the Pacific Northwest. Great outbreaks of this species caused extensive damage in 1900 and in 1914, and scattered local outbreaks of a less serious nature occurred in 1925. This species is present in both the humid and semi-arid regions. (8)

Rose, A. H. 1969. Noteworthy insects in Ontario in 1968. Proc. Entomol. Soc. Ont., 99:7-11.
The variegated cutworm, *Peridroma saucia*, severely damaged white spruce seedlings germinated in plastic tubes at the Fort Frances Nursery, Ontario. (10)

Ross, W. A. 1915. Niagara district miscellaneous insects. 45th Annu. Rep. Entomol. Soc. Ont.:22-28.
"The variegated cutworm (*Peridroma saucia*) made itself notorious in a Niagara Falls greenhouse this month by attacking the heads of chrysanthemums and razing off the florets." (25)

Ross, W. A. 1915. Troublesome insect pests. The Florists' Exchange, 40(9):473.
"The variegated cutworm in its capacity as a greenhouse pest has made itself especially notorious by razing off the florets of chrysanthemums and by eating holes in carnation buds. The mature larva is a smooth, cylindrical, plumb caterpillar about 2 inches long. It varies in color from pale grey to brownish, is mottled and streaked with dark brown or black, and is marked along each side with a yellowish band. The caterpillars work chiefly at night and during the day they are usually found coiled up in the soil just beneath the surface." Control measures are discussed briefly.

Ruhmann, M. H. 1936. Pests of cultivated plants. Prov. Brit. Col. Dep. Agr. Hort. Circ. 72:39-40.
"The variegated cutworm (*Peridroma saucia*) is one of the most destructive that the growers of the province have to contend with. It is a most cosmopolitan feeder, almost any kind of vegetation being acceptable. Field crops, truck crops, and fruit trees suffer to a considerable extent every year. In a late spring, when little vegetation is available, they will attack young fruit trees, eating not only the buds, but also stripping the bark off the tender branches. The life history is not well known, but undoubtedly two broods occur in British Columbia, the first brood being most prominent during April and early May, the second during the month of August. The adult is a night-flying moth. The winter is passed in the larval, pupal, and adult stages in the ground." Control measures are discussed briefly. The egg, larva, and moth are figured.

Ruhmann, M. H. 1941. Report of the provincial entomologist. Brit. Col. Dep. Agr. Rep. 35:56-57.
"The variegated cutworm (*Lycophotia margaritosa*). An outbreak of this insect was general throughout the interior, being most severe through the Slocan Valley and the Nelson District." (56)

Russo, G. and E. Tremola. 1961. I risultati della sperimentazione di lotta contro gli insetti del pomodoro esequita in Campania negli anni 1958-1959. Ann. della Facoltà di Scienze Agrarie della Univ. degli Studi di Napoli, Portici, 26:61-79.
To control insects attacking tomato in Campania (*Heliothis armigera, Caradrina exigua, Agrotis segetis,* and *Rhyacia saucia*), apply two to three treatments, 15-20 days apart, with one of the following products: DDT a.i. 200 gm.; aldrin a.i. 200 gm.; lindane a.i. 150 gm.; or chlordane a.i. 150 gm. Begin the treatments after the polling of the plants and the flowering give good results from the toxicological point of view.

Ryan, H. J. 1945. Annual report, agricultural commissioner, county of Los Angeles for 1945:9-10.
"Variegated cutworm (*Peridroma margaritosa saucia*) caused some loss to a few celery plantings."

Sager, S. M. 1960. On the transtadial transmission of insect viruses. J. Insect. Path., 2(3):307-309.
"On the basis of numerous observations with at least seven species of Lepidoptera, there are indications that complete transtadial transmission (*i.e.*, stage-to-stage transmission throughout the host's life cycle) of insect viruses does occur in their respective hosts. In some insects, however, it may be the exception rather than the rule." The granulosis virus of *Peridroma margaritosa* was one part of the study. (307)

Sanborn, C. E. 1912. Garden and truck crop insect pests. Okla. Agr. Exp. Sta. Bull. 100:1-76.
"The variegated cutworm, one of the climbers, is without doubt the most widely distributed and best known of any of our cutworms. It is very cosmopolitan in its feeding, living with apparent relish on a wide range of cultivated plants capable of eking out an existence under most unfavorable circumstances." (65)

Sanborn, C. E. 1916. Garden and truck crop insect pests. Okla. Ext. Circ. 41: 65-66.
"The variegated cutworm, one of the climbers, is without doubt the most widely distributed and best known of any cutworms. It is very cosmopolitan in its

feeding, living with apparent relish on a wide range of cultivated plants and capable of eking out an existence under most unfavorable circumstances. The fully grown cutworm (see Fig. 64) measures about one and three-fourths inches in length, is rather variable in color, as is also the moth. The ground color is rather dull brown flecked with gray and smoky-black above. There is a row of four to six yellow spots extending along the middle of the back or dorsal view, characteristic of the species."

Sanderson, E. D. 1902. Insects injurious to staple crops. New York. 295 pp.
"Like all similar crops, the sugarbeet is often subject to the midnight raids of the deadly cutworms and when present in any number they should be carefully guarded against while plants are young." *Peridroma saucia* is illustrated in Fig. 146. Remedies for cutworms are discussed. (256)

Sanderson, E. D. 1906. Miscellaneous cotton insects in Texas. U. S. Dep. Agr., Bur. Entomol. Bull. 57:1-63.
"*Peridroma saucia* prefers garden vegetables for food, but it has been taken upon corn and doubtless occasionally attacks cotton." (10-11)

Satterthwait, A. F. 1933. Larval instars and feeding of the black cutworm, *Agrotis ypsilon* Rott. J. Agr. Res. 46:517-530.
"In the variegated cutworm, *Lycophotia margaritosa saucia* Hbn. (pp. 112-113), the reaction to cool weather was regular in the tardy larval development in the spring at average mean temperatures of 61° F. and lower, and in the summer, but the larval period lengthened beyond the spring periods at September average mean temperatures not lower than 73.5°." (529)

Saunders, W. 1883. Insects injurious to fruits. J. B. Lippincott and Co., Philadelphia. 436 pp.
Agrotis saucia was considered an apple pest. The egg, larva, pupa, and moth of the variegated cutworm are described briefly and figured. (106-107)

Schaefer, B. and A. Breyer. 1942. List of the Lepidoptera of Catamarca and various observations. Soc. Entomol. Argen. Rev., 11(3):221-229.
"*Lycophotia margaritosa ochronata* Hmp. Los Angeles (Capayán) 1800 m. (above sea level) November 1941. *Lycophotia margaritosa saucia* Hbn. Catamarca (Capital) 520 m. (above sea level) August 1939." (227)

Schafer, J., P. Grau, and L. C. Terriere. 1968. Temperature-induced wing malformation in alfalfa loopers and variegated cutworms. J. Econ. Entomol., 61(2): 575-576.
Variegated cutworm moths developing from pupae held at 30° C. on the oil-supplemented diet had less wing deformity than those from the unsupplemented diet. However, in this species neither the oil supplement nor the host plant diet fully compensated for the temperature effect. All adult cutworms reared from bean medium and dock at the 23° C. pupal temperature had normal wings, but at 26° C. some deformities appeared. At 30° C., 13% of the adults from the bean medium had wing deformities and 23% of the adults from the dock plant were deformed.

Schaffner, J. V., Jr. and C. L. Griswold. 1934. Macrolepidoptera and their parasites reared from field collections in the northeastern part of the United States. U. S. Dep. Agr. Misc. Pub. 188:1-160.
"*Lycophotia margaritosa* Haw. Food plants: Garden crops. (A cutworm.) Occurrence: Collections from Maine, Massachusetts, Rhode Island, and New Jersey

Totals received: Collections, 12; larvae, 20; years, 5. Larvae: June to August. Pupae: July to September. Adults: August and September." (43)

Schawerda, C. 1929. Miene vierte Lepidopterenausbeute aus dem Hochgebirge Korsikas. Zeit. des Öster. Entomol.-Verein. Wien., 14(6):57.
The author described a dark, blackish-brown form of *Agrotis* (=*Peridroma*) *saucia* from the mountains in Austria as a new variety, *tenebricorsa*. Since the moths of this species vary so greatly in coloration, it is doubtful that this is a valid scientific name.

Schuster, M. F. and J. C. Boling. 1973. Species of cutworms in the lower Rio Grande valley. J. Econ. Entomol. 66:999-1000.
This cutworm was found most commonly in sandy soils in Willacy and Hidalgo counties, Texas, on seedling cotton. A total of 93 cutworms were found in sandy loam soils, while only 3 were found in clay-loam soils.

Sciaroni, R. H., P. A. Minges, W. H. Lange, and W. C. Snyder. 1953. Brussels sprouts production in California. Calif. Agr. Exp. Sta. Ext. Serv. Circ. 427: 1-16.
The variegated cutworm, *Peridroma margaritosa*, is the most common cutworm found on brussels sprouts in California. (9)

Scott, J. W. 1918. Report of the parasitologist. 28th Annu. Rep. Univ. Wyo. Exp. Sta.:66-127.
Peridroma saucia damaged gardens and was considered economically important in Wyoming in 1917.

Selman, C. L. and H. E. Barton. 1972. Seasonal trends in catches of moths of 12 harmful species in blacklight traps in northeast Arkansas. J. Econ. Entomol., 65:1018-1020.
"Variegated cutworm. From April 3 to Oct. 4 we trapped 89 specimens (Fig. 3). Our curve revealed three peaks: the first near the middle of April, the largest during the first half of June, and the smallest August 14. We trapped more second-brood moths than the other broods of this species combined. Forbes (1904) also found second-brood moths to be the most numerous brood in Illinois, but they appeared in greater abundance nearer the latter part of June. Garman (1895) reported the emergence of the second-brood moths in Kentucky to be 3 weeks later than in Arkansas." (1020) These conclusions are based on 1 year's (1970) study.

Severin, H. H. P. and H. C. Severin. 1915. Life history, natural enemies, and the poisoned bait spray as a method of control of the imported onion fly, with notes on other onion pests. J. Econ. Entomol. 8:342-350.
"Cutworms caused a slight amount of injury in the onion-growing districts near Racine, Wis., in 1913. The damage to onions by these pests was principally the work of the spotted cutworm (*Noctua c-nigrum* Linn.) and the variegated cutworm (*Peridroma saucia* Hbn.). The spotted cutworm was so heavily parasitized by a parasite, *Apanteles* (*Protapanteles*) sp., in 1913 that little injury was caused to the onions by the pest." (349)

Sherman, F., Jr. 1914. Cutworms. (Several species). Bull. N. C. Dep. Agr., 35(5):15-19. (Whole No. 196.)
The life histories and control for cutworms in general are discussed. The life stages of the variegated cutworm are illustrated. (17)

Sherman, F. 1925. Report of the division of entomology. Annu. Rep. N. C. Agr. Exp. Sta. 47:1-95.
"Variegated cutworm (*Peridroma saucia*). Becomes active a little later in season than the preceding and is less destructive but persists throughout the season, apparently producing several generations. The moths come to bait traps abundantly, and also are attracted to lights. The cutworms of the species seem more susceptible to bacterial disease than the others." (73)

Shorey, H. H. and R. L. Hale. 1965. Mass rearing of the larvae of nine noctuid species on a single artificial medium. J. Econ. Entomol., 58(3):522-524.
"A simple artificial medium has been developed and handling procedures have been devised to facilitate the mass rearing of a variety of noctuid species with a minimum expenditure of time and money. The medium, composed of dry beans, yeast, ascorbic acid, agar, water, and three mold inhibitors, satisfactorily supports the development of larvae of the cabbage looper, *Trichoplusia ni* (Hübner); the alfalfa looper, *Autographa californica* (Speyer); the yellow-striped armyworm, *Prodenia ornithogalli* Guenee; the beet armyworm, *Spodoptera exigua* (Hubner); the bollworm, *Heliothis zea* (Boddie); the tobacco budworm, *H. virescens* (F.); *H. phloxiphaga* G. and R.; the armyworm, *Pseudaletia unipuncta* (Haworth); and the variegated cutworm, *Peridroma saucia* (Hubner). Details are given concerning the development, viability, and fecundity of laboratory reared individuals of the first six of these species." (522)

Shvetsova, O. I. and Ts'ai Hsü-Yü. 1962. Virus diseases of *Agrotis segetum* Schiff. and *Hadena sordina* Bkh. (Lepidoptera, Noctuidae) under conditions of simultaneous infection with granulosis and polyhedral disease. Entomol. Rev., Translation of Entomol. Oboz., 41(4):781-787.
The authors review the findings of Ts'ai Hsü-Yü in 1962. (See Ts'ai Hsü-Yü.)

Silveira-Guido, A. and J. Carbonell-Bruhn. 1965. Los insectos enemigos del girasol en El Uruguay. Univ. Rep., Fac. Agronomia, Bull. 81:1-64.
Synonomy, economic importance, description of life stages, life cycle, and control of the variegated cutworm are discussed. The geographical distribution is given as Canada to Argentina, France, Spain, Denmark, England, Germany, Holland, Russia, Central Europe, Azores, Hawaii, and North Africa. (23)

Silver, G. T. and D. A. Ross. 1958. Province of British Columbia forest insect survey. Can. Dep. Agr. Annu. Rep., Forest Ins. Dis. Surv.:1-114.
"Variegated cutworm, *Peridroma margaritosa* (Haw.). This cutworm, usually associated with non-forest hosts, caused considerable damage to several beds of Douglas fir seedlings at the Duncan nursey on Vancouver Island. Eggs collected off silver poplar hatched and were reared to adults, establishing a new host record for British Columbia. Collections: Coast 8." (95)

Sirrine F. A. 1900. Insects infesting carnations. The Weekly Florist's Rev., 5(117):343-347.
The variegated cutworm is discussed briefly as one of the worst pests of carnations in forcing houses. (346)

Slingerland, M. V. 1895. Climbing cutworms in western New York. Cornell Univ. Agr. Exp. Sta. Bull. 104:551-600.
"Variegated Cutworm. Its habits and food plants. In Europe, this cutworm is recorded as feeding on common chickweed, plantain, and *Rumex acutus*. In this country it usually feeds on low-growing plants, but has several times assumed climbing habits. In confinement it has been fed upon knot grass, corn, grass,

tips of grapevines, apples, willow, eupatorium, white mulberry, plantain, the leaves of soft maple, boxelder, elm, apple, cherry, strawberry, currant, peach, raspberry, rose, and purslane, etc. It attacks almost any field crop, and weeds even are eaten with evident relish when no more succulent food is at hand.

"It seems to occur more frequently in cold-frames and greenhouses than other cutworms. In 1869, Dr. Riley found it doing considerable damage to a lot of young grapevines in a cold-frame; it has also been quite destructive to lettuce grown in similar situations. In 1880, they were found climbing smilax in a greenhouse at Lowell, Mass., and were again reported destroying smilax in 1882 from Germantown, Pa. In 1893, a correspondent in Kalamazoo, Mich., sent us specimens of this cutworm which he said had nearly destroyed his smilax; they climbed up the strings to the top and ate all the leaves. Thus, smilax seems to be a favorite food for them in greenhouses. Several instances have been recorded of carnations being attacked in greenhouses by this cutworm. They climb up and eat into the buds; in one instance nearly 500 buds were thus destroyed in less than a month. The source of infection in one case 'clearly traced to earth taken in the fall from beneath the sod in a pasture field which was badly infected with cutworms;' doubtless, in most cases, this is the way the young cutworms are introduced into greenhouses. In 1893, a correspondent in Bolivar, N. Y., wrote us that nearly 100 fruits on his tomato plants in his greenhouse had been badly damaged by cutworms; they preferred the fruit to the leaves. From specimens sent we bred the moth of this variegated cutworm.

"In one instance this cutworm climbed cabbage stalks and bored in various directions throughout the forming heads, and were found coiled up in the moist places they had eaten out for themselves.

"In 1886, it assumed the climbing habit in Missouri with very serious results to the buds of fruit and shade trees. In 1888, it damaged grafts and ate off the tips of fruit trees in British Columbia, and it also committed serious depredations the same year in Arkansas by devouring the foliage of potato vines. In California it has twice appeared in very destructive numbers on the grape vine, once in the spring of 1893 and again in 1895; in some cases the vines were entirely defoliated and the young shoots cut off.

"The above accounts of the depredations of this variegated cutworm show that its varied habits render it a very serious pest, as it may cut off field and garden crops, or it may appear as a climber on the choicest greenhouse plants or outdoors on fruit trees and especially in vineyards." (666-667)

Slingerland, M. V. 1895. Climbing cutworms in western New York. Cornell Univ. Agr. Exp. Sta., Entomol. Div. Bull. 104:639-685.
This article is identical to the previous article by Slingerland.

Smith, G. L. 1942. California cotton insects. Univ. Calif. Agr. Exp. Sta. Bull. 660:1-50.
Peridroma saucia occurs in cottonseed trash and late bolls, feeds on foliage, and kills seedlings. Poison bait is suggested for control. (31-32)

Smith, J. B. 1890. Contribution toward a monograph of the insects of the lepidopterour family Noctuidae of temperate North America--revision of the species of the genus *Agrotis*. Bull. U. S. Nat. Mus. 38:5-13.
"*Peridroma* has the male antennae simple, the fore wings trigonate, regularly widening from base, the apices marked, outer margin oblique. *Saucia* is the generic type. Two groups are recognized in this genus. The first, of which

saucia is also type, has the primates quite strongly produced apically and has a divided thoracic tuft." (9-10)

Smith, J. B. 1893. Catalogue of the lepidopterous superfamily Noctuidae found in boreal America. Bull. U. S. Nat. Mus. 44:69.
Twenty references to synonomy are given for *Peridroma saucia*. "Habitat--North and South America; Europe; Asia. Canada, July and August; New York and Illinois, August and Sept.; District of Columbia, Sept. and Oct.; California in April and May. This species has a large economic bibliography. In the British Museum Mr. Butler has placed a lightly marked specimen of *turris* Grote with typical *saucia*, and has published them as identical. They differ structurally. A specimen labeled *inermis* is in the Harris collection at Boston." (69)

Smith, J. B. 1899. Insects of New Jersey. Suppl. 27th Annu. Rep. State Bd. Agr.: 1-755.
"*P. saucia* Hbn. Throughout the State, July to November; the larva is one of the injurious cutworms and a general feeder." (409)

Smith, J. B. 1906. Economic entomology. J. B. Lippincott Co., Philadelphia. 475 pp.
This is designed as a textbook for agricultural schools and colleges and for use by farmers and fruit growers. The collection, habits, and control of cutworms are discussed. The egg, larva, and adult *Peridroma saucia* are illustrated. (290-294).

Smith, K. M. and N. Xeros. 1954. A comparative study of different types of viruses and their capsules in the polyhedroses and granuloses of insects. Parasitol., 44(3-4):400-406.
The author suggested that there are two, not one, rods per capsule in the granulosis virus of *Peridroma margaritosa* (=*saucia*). Steinhaus (1947) suggested that each granule might contain a single virus particle. (402)

Smith, L. M. and E. M. Stafford. 1955. Grape pests in California. Calif. Agr. Exp. Sta. Circ. 445:1-63.
The variegated cutworm, *Peridroma margaritosa*, is one of the three most common cutworms attacking grapes. The other two are *Agrotis ypsilon* and the brassy cutworm, *Orthodes rufula* (Grote). (43)

Smith, R. C. 1927. Alfalfa production in Kansas. Kans. Agr. Exp. Sta. Bull. 242, pp. 1-42.
The variegated cutworms feed on the young growth of alfalfa after the first cutting and may keep it down. They overwinter as young half-grown larvae in alfalfa fields and complete their growth in June, causing the greatest injury at that time. (38)

Smith, R. C. 1927. Observations on *Euplectrus platyhypenae* How. (Chalcidae), a parasite of noctuid larvae. Bull. Brooklyn Entomol. Soc., 22(3):128-135.
"Early in June 1926, the variegated cutworm, *Lycophotia margaritosa* Haw., was very plentiful in various localities in Kansas. This insect had not occurred in any numbers in the state since 1920. An outbreak with some damage was expected, but it did not occur chiefly because of prompt action on the part of predators and parasites. The most abundant and effective Hymenopterous parasite observed was *Euplectrus platyhypenae* How. An opportunity was therefore provided to make some observations on its life history and habits because of its abundance. In spite of the fact that it is supposed to be a common Noctuid parasite, it has not been reported as a parasite of the variegated cutworm, and

it has never been seen by the entomologists of this station on any hosts. It has not been encountered in seven seasons of study of alfalfa insects. Since it has such striking habits, and since so little has been recorded about it, these illustrations and rather fragmentary observations may be of interest." (128)

Smith, R. C. 1932. Diseases, insects and other pests injurious to plants. 6th Bienn. Rep. Dir. Kans. Agr. Exp. Sta., pp. 85-100.
"Variegated cutworm. Some rather unusual damage by variegated cutworms occurred in the horticultural orchard during 1931. The outbreak started in a field of vetch and in the orchard cover crop of vetch. The larvae climbed the grape vines, damaged the grape foliage severely, and ate off many small bunches of developing grapes. Others climbed the apple trees, ate the bark in places and the young apples on the trees. Others concentrated on the dropped apples and ate them to the core. Others climbed the Mahaleb cherry trees and ate large batches of bark from these trees. These feeding habits are believed to be unreported for these larvae. Several sowings of poisoned bran mash of the formula usually recommended gave excellent results. The vetch was plowed up and the outbreak brought under control a few days after its discovery. The larvae, particularly in the vetch field, showed a parasitism of approximately 30% by *Apanteles militaris*." (94-95)

Smith, R. C. 1938. A preliminary report on the insects attacking bindweed, with special reference to Kansas. Trans. Kans. Acad. Sci., 41:183-191.
Subterranean insects were not found to attack bindweed stems and roots to any great extent. Two instances of root feeding by the variegated cutworm (*Lycophotia margaritosa* Haw.) were seen. They damaged the roots of plants but did not kill them. (188)

Smith, R. C. and E. G. Kelly. 1938. The seventh annual insect population summary of Kansas. Covering the year 1937. J. Kans. Entomol. Soc., 11(2):54-76.
"There was a definite widespread outbreak of variegated cutworms during early June in alfalfa fields and gardens in eastern and southern counties of Kansas and extending as far west as Osborne County. A few larvae of this species were received May 18 from southern Kansas which was the time that the outbreak of armyworms was developing. The damage was severe in many communities. Growth of alfalfa following the first cutting was prevented. Reports of as many as 30 larvae to the square foot were received. The larvae were mostly grown by June 10. Rains in the infested areas interfered with bran mash sowings. Some cutworm damage to alfalfa fields in the Kaw Valley was observed in mid-July." (65)

Smith, R. C., E. G. Kelly, G. A. Dean, H. R. Bryson, and R. L. Parker. 1943. Common insects of Kansas. Rep. Kans. State Bd. Agr., 62(255):1-440.
"The moth of the variegated cutworm (Fig. 89) has brownish-gray front wings which are darker near outer margins and reddish toward front margins. They are crossed by four wavy lines and there is a kidney-shaped and a small circular white spot near the center of front wings. Hind wings are gray with a border of brown. Wingspread 1-1/2 to 2 inches. Caterpillars are grayish mottled with a row of velvety black spots on each side. They damage alfalfa at the time of the first cutting by keeping down the young growth. Also attack vegetable fields and fruit crops. Control: Sow poisoned bran mash in afternoons, especially under hay piles and windrows." (243)

Smith, R. I. 1908. Some insect enemies of garden crops: Containing practical information concerning the habits and life histories of certain insects, with remedial suggestions. N. C. Agr. Exp. Sta. Bull. 197, pp. 1-64.

Cutworms in general are described. Their habits, life histories, and remedies are discussed briefly. The egg, larva, and moth of *Peridroma saucia* are figured.

Snyder, K. D. 1954. The effect of temperature and food on the development of the variegated cutworm, *Peridroma margaritosa* Haw. (Order Lepidoptera Family Noctuidae.) Ann. Entomol. Soc. Amer., 47:603-613.
"Summary. In a series of controlled experiments it was demonstrated that the variegated cutworm *Peridroma margaritosa* Haw. was influenced in its development by both temperature and the quality of food. No diapause was encountered during experiments in which larvae were reared at temperatures ranging between 10° and 15° C. Development of the cutworm occurred between constant temperatures ranging from 15° to 30° C. Between these temperatures the developmental period decreased with an increase in temperature, although above 25° C. the decrease was not pronounced. At temperatures below the optimum (20° to 25° C.), pupal weights were approximately the same as at the optimum, but above the optimum, pupal weights decreased rapidly, and adults often failed to emerge.

"Where given a chance to select a host, newly hatched larvae most frequently went to alfalfa. Hosts were compared at a constant temperature of 25° C. Their suitability was judged by: 1) relative mortality of larvae and pupae, 2) relative duration of development, and 3) relative weight of pupae. Hosts such as string bean, kale, and alfalfa were found to be the most favorable. Among the poorer hosts were lettuce, tomato leaf, and corn leaf. However, the condition of the host exerted a marked influence and resulted in wide variations in the rate of development. With any given host, development was best where the food was fresh and succulent." (613)

Speare, A. T. 1920. Further studies of *Sorosporella uvella*, a fungous parasite of Noctuid larvae. J. Agr. Res., 18(8):399-438.
Several hosts were used, one of them *Peridroma saucia*, to test the parasitism of the fungus *Sorosporella uvella* and to determine a method of infection which would be adapted to the inoculation of insects artificially on a large scale. (432)

Specht, H. B. 1972. Cutworms of tobacco in Nova Scotia. I. Species complex and infestation. Can. Entomol., 104(12):1855-1864.
"The principal injurious species to commercially grown flue-cured tobacco in Nova Scotia was the dark-sided cutworm, *Euxoa messoria* Harr. A trace of the black cutworm, *Agrotis ipsilon* Hufn., was found in one field. The variegated cutworm, *Peridroma saucia* Hbn., caused minor damage in September. Other species reared from field-collected larvae, and bait and light trap catches, included: yellow-headed cutworm, *Apamea amputatrix* Fitch; armyworm, *Pseudoletia unipuncta* Haw.; *Amphipyra tragopoginis* L.; W-marked cutworm, *Spaelotis clandestina* Harr.; and the glassy cutworm, *Crymodes devastator* Brace.

Cutworm larvae damaged young tobacco plants during June through mid-July. The largest infestation encountered during 1971, near the margin of a field, killed 5% and injured 20% of the young plants. Infestations in other fields injured 1% to 3% of the plants, with higher incidences near the borders. A seasonal total of 0.024 cutworm larva injured 0.24 tobacco plant/m^2 and destroyed 5% to 15% of the injured plants in experimental tobacco field plots planted in a 4-year-old rye field." (1855)

Specht, H. B. 1973. Control of cutworms in tobacco. Dark-sided cutworm, *Euxoa messoria* Harr.; variegated cutworm, *Peridroma saucia*; black cutworm, *Agrotis ipsilon*. Annu. Rep. Can. Dep. Agr. Res. Sta., pp. 1-116.

Treatments were applied to two Somerset sandy loam tobacco fields in rye the previous year. Each plot consisted of 3,000 plants, cv. Hicks broadleaf, in 17 325-ft. rows. Phosvel and N-2596 were superior to Supracide at dosages of 1/4 to 2 lb. AI/A. (61)

Speyer, A. 1875. Europäisch-amerikanische Verwandtschaften. II. Entomol. Zeitung (Settin). 36(1-3):97-127.
The author compared the appearance and morphology of variegated cutworm moths from North America and Europe. The species is distributed throughout the northern hemisphere.

Speyer, A. 1875. Europäisch-amerikanische Verwandtschaften. Entomol. Zeitung (Settin). 36(4-6):129-175.
The synonomy of *Agrotis* (=*Peridroma saucia*) Hüb. is given as *Agrotis inermis*, var. *margaritosa* Haworth, *Agrotis ambrosioides* Mor. and *Agrotis nigricans* L. (Translated from German.)

Stanley, W. W. 1936. Studies of the ecology and control of cutworms in Tennessee. Tenn. Agr. Exp. Sta. Bull. 159, pp. 1-15.
The variegated cutworm, *Lycophotia margaritosa* Haw., has three or four generations each year in Tennessee. It overwinters as a pupa. The eggs of the variegated cutworm are figured. (3-4)

Stanley, W. W. and S. E. Bennett. 1965. Seasonal abundance of 13 species of moths caught in light traps in Tennessee. J. Tenn. Acad. Sci., 40(4):118-131.
Black light traps were operated in seven counties in Tennessee from 1955 to 1958. Variegated cutworm moths were caught from the first week in March to the second week in November. Plate 10 graphs the light trap catches of *Peridroma saucia* for the 3-year period.

Staudinger, O. 1871. Catalog der Lepidopteren des Europaeischen Faunengebiets. I. Macrolepitoptera. Dresden, Germany.
"1226. Saucia Hb. 378; Tr. V. 1.149; God. v, 69, 4; Frr. 525; I, 271; Aequa H. G. 811-2. a. ab. *Margaritosa* Hw. Lep. Br. 218(1810?). Aequa Hb. 564 (1815?); Tr. V. 1. 150; God. V, 69, 3; Gn. 1. c (ab. variegata). *Germ. m; Eur. c. oc. et m; Maur; Canar; As. min; Arm.*" (88)

Stedman, J. M. 1902. The more important insects injurious to wheat in Missouri. 34th Annu. Rep. Mo. State Bd. Agr., pp. 55-141.
The habits, life history, natural enemies, and control of the variegated cutworm, *Peridroma saucia*, are discussed. (118-124)

Stedman, J. M. 1906. The more important insects injurious to corn in Missouri. Mo. Bd. Agr. Rep. 38, pp. 271-286.
This publication is the same as the one by Stedman in 1902.

Steinhaus. E. A. 1947. A new disease of the variegated cutworm, *Peridroma margaritosa* (Haw.). Science, 106(2753):323.
"The granular inclusions characteristic of this disease have points of similarity with those described by Paillot (2) in the case of *pseudograsserie* 1 of another cutworm, *Euxoa segetum* Schiff., and possibly with those briefly described by Graham (1) in the case of a disease of the spruce budworm, *Archips fumiferana* (Clem.). It is possible that these agents are representatives of a distinct group of virus diseases of insects, the other two groups being the well-known polyhedroses and those infections (*e.g.*, sacbrood) characterized by the absence of inclusion bodies of any kind."

Steinhaus, E. A. 1949. Principles of insect pathology. McGraw Hill Book Co., New York, N. Y. 757 pp.
"Until 1947 no instance of a granulosis had been reported in insects outside of France. In that year an outbreak of disease occurred among variegated cutworms, *Peridroma margaritosa* (Haw.), being reared in an insectary in California. The mortality due to this disease was very high. Only a small percentage of the caterpillars ever reached pupation, and only about 50 percent of the eggs produced by the moths that later emerged proved fertile." (508)

Steinhaus, E. A. 1951. Possible use of *Bacillus thuringiensis* Berliner as an aid in the biological control of the alfalfa caterpillar. Hilgardia, 20:359-381.
Nine strains of *Bacillus cereus* were fed to five test insects. None of them showed any consistent degree of pathogenicity for any of the five test insects. The same test was done with *B. thuringiensis* and proved to be pathogenic to the test insects, with almost 99% pathogenicity. *Peridroma margaritosa* was one of the test insects used and appeared to be the least susceptible to *B. thuringiensis*. (363)

Steinhaus, E. A. 1951. Report on the diagnoses of diseased insects 1944-1950. Hilgardia, 20:629-678.
Granuloses disease was discovered in the variegated cutworm in California. The variegated cutworm infection was the first of its kind to be reported outside of France. After considerable study, the virus itself was isolated and described. (634)

Steinhaus, E. A. 1957. New records of insect-virus diseases. Hilgardia, 26:417-430.
"A granulosis of the variegated cutworm, *Peridroma margaritosa*, has been known since 1947 (Steinhaus, 1947; Steinhaus, Hughes, and Wasser, 1949). This virus is shown in figure 1. In May 1953, our laboratory received from H. L. Chada several dead specimens of the cutworm collected from alfalfa near Denton, Texas. Upon microscopic examination the disintegrating body contents of these insects were filled with polyhedra; the virus was demonstrated with the electron microscope (fig. 2). (The diagnosis was made by C. G. Thompson, then a member of the staff of our laboratory.) To our knowledge, there is no previous record of a polyhedrosis in *P. margaritosa*." (419)

Steinhaus, E. A. 1958. Crowding as a possible stress factor in insect disease. Ecology, 39:503-514.
"This paper describes an attempt to investigate, in a preliminary way, the effects of crowding on the occurrence of disease in certain lepidopterous insects. The insects used were the larvae of *Colias philodice eurytheme* Boisduval, *Junonia coenia* Hübner, and to a lesser extent *Peridroma margaritosa* (Haw.) and *Phryganidia californica* Packard. Depending upon the experiment, both field-collected and laboratory-reared specimens were used." (513)

Steinhaus, E. A. 1958. Stress as a factor in insect disease. Proc. Inter. Cong. Entomol., 10(4):725-730.
"The phenomenon of latency in insect viruses is one aspect of a broader field of endeavor that we are investigating in our laboratory. Our approach to the problems involved (and covered by this symposium) is from the standpoint of attempting to understand the relation between disease and certain stressors and incitants. We are presently, or expect to be, concerned with approximately 20 different types of stressors (*e.g.*, crowding, heat, cold, chemicals, nutrition, radiation, etc.) and their role in the manifestation of disease in insects."

The variegated cutworm, *Peridroma saucia*, was one of the insects considered in this study. This report presents a brief summary of some of the results gathered from preliminary experiments along these lines. (725)

Steinhaus, E. A. 1959. *Serratia marcescens* Bizio as an insect pathogen. Hilgardia, 28:351-380.
"*Serratia marcescens* Bizio is a small, gram-negative, rod-shaped bacterium characterized by the production of a red pigment. Generally speaking, it is a saprophytic organism commonly found in water and soil, and in milk, bread, and other foods. It has been known by several synonyms, including *Bacillus prodigiosus* (Flügge), *Bacterium prodigiosum* (Lehm. and Neum.), and *Chromobacterium prodigiosum* (Top. and Wil.). Under ordinary circumstances it is nonpathogenic to vertebrates except in enormous doses. It has been found associated with insects in several ways and under a variety of conditions (Steinhaus, 1946, 1949). In the present paper we are primarily concerned with it as a pathogen for insects." *Peridroma margaritosa* was one of the test insects.

Steinhaus, E. A. 1960. Notes on polyhedroses in *Peridroma, Prodenia, Colias, Heliothis* and other Lepidoptera. J. Insect. Path., 2(4):327-333.
"Miscellaneous observations on polyhedroses in several species of Lepidoptera are reported. The genera of Lepidoptera represented include *Peridroma, Prodenia, Colias,* and *Heliothis*. In the case of *Peridroma*, data pertaining to a nuclear polyhedrosis were compared with those relating to a granulosis. Incubation periods, strain differences, cross infestivities, symptomatology, and the effects of certain stressors were determined or studied in individual instances. Also reported are new records of virus-diseased insects received as accessions for diagnosis." (327)

Steinhaus, E. A. and J. P. Dineen. 1960. Observations on the role of stress in a granulosis of the variegated cutworm. J. Insect Path., 2(1):55-65.
An attempt was made to gain some indication as to the role of five different "stressors" in a granulosis of the variegated cutworm, *Peridroma margaritosa* (Haw.). In general it was found that, with the possible exception of ether, none of the test factors (excessive heat, excessive cold, ultraviolet light, abnormal nutrition) significantly enhanced, promoted, or induced granulosis infection in *Peridroma* larvae. Considerable mortality in the test insects resulted from the action of the test factors themselves, and from other non-virus causes, such as bacterial infection. (55)

Steinhaus, E. A. and K. M. Hughes. 1952. A granulosis of the western grape leaf skeletonizer. J. Econ. Entomol., 45(4):744-745.
A granulosis virus of the western grape leaf skeletonizer was considered as probably a new species as indicated by the fact that it was not infectious for the variegated cutworm and several other lepidopterous insects. (745)

Steinhaus, E. A., K. M. Hughes, and H. B. Wasser. 1949. Demonstration of the granulosis virus of the variegated cutworm. J. Bacteriol., 57:219-224.
"The first known and only published instance of a granulosis of an insect in the Western Hemisphere is that of the variegated cutworm, *Peridroma margaritosa* (Haw.), recently reported from California by Steinhaus (1947). Other examples of this type of disease have been observed in Europe in larvae of the cabbage butterfly, *Pieris brassicae* (Linn.), in the cutworm, *Euxoa segetum* Schiff. (Paillot, 1926, 1934), and in the pine-shoot roller, *Cacoecia murinana* Hb. (Bergold, 1948). As this group of insect diseases becomes better known, additional host species in various parts of the world will in all probability be recognized. Of particular interest at the present time is the nature of the

etiological agents of these diseases. That they are viruses has been suspected for some time, but only recently has this fact been conclusively demonstrated. To clarify the virus nature of the granulosis of the variegated cutworm is the object of the present report." (219)

Stephens, J. F. 1829. Illustrations of British entomology; or a synopsis of indigenous insects containing their generic and specific distinctions with an account of their metamorphoses, times of appearance, localities, food, and economy, as far as practicable. Haustellata, 2: 202 pp.
"This rare species (*Agrotis aequa* n. sp.) was first detected in this country by Mr. Hatchett; it has since been taken by Messrs. Raddon and Stone near London. The late period of its appearance (September and October) is probably the reason why so few examples have occurred. It is evidently very variable, like the cognate species *corticea, segetum,* and *suffusa*. I possess a specimen captured in Hertfordshire. Several examples were taken near Epping in 1827 by H. Doubleday."

Stern, V. M., V. Sevacherian, A. Mueller, and J. Ryan. 1968. Effect of naled, trichlorfon and *Bacillus thuringiensis* on three species of lepidopterous larvae attacking alfalfa in California. J. Econ. Entomol., 61(5):1324-1327.
A wide variety of lepidopterous larvae feed on the alfalfa crop in California, but only a few species increase to sufficient numbers to cause injury. The three species of most concern are the alfalfa caterpillar, the western striped armyworm, and the beet armyworm. Occasionally webworms and the variegated cutworm rise to pest status in certain areas.

Strand, E. 1916. Aberrationen der Noctuiden-subfamily Agrotinae und Cuculliinae. Archiv. fur Naturgeschichte, Berlin. Abt. A 81 Heft, 12:146.
Lycophotia margaritosa Haw. ab. *fuscobrunnea* Strand. The author describes a new form of *L. margaritosa*. It appears from the description that the specimen is another color form.

Strickland, E. H. 1916. The army cutworm in southern Alberta. 46th Annu. Rep. Entomol. Soc. Ont. 1915, pp. 1-232.
In 1900, variegated cutworms were so abundant in British Columbia that they were laying their eggs on the leaves and stems of trees, windows, verandas, and even on clothes hanging out to dry. (96)

Stuckey, H. P. 1938. Entomology. Annu. Rep. Ga. Agr. Exp. Sta. 50:1-99.
"In April tomatoes in the greenhouse were damaged by the variegated cutworm, *Lycophotia saucia* Hbn." (71)

Sweetman, H. L. 1936. The biological control of insects. Comstock Publishing Co., Inc., Ithaca, N. Y., pp. 110-126.
"*Archytas analis* Fabr. is a native parasite of the variegated cutworm, *Lycophotia margaritosa* Haw. This fly is a nectar and pollen feeder. Copulation occurs shortly after emergence of the females. Approximately 2 weeks are necessary for completion of the prelarviposition period. The larviposition period occupies 1 to 5 days, although larvae may not be deposited daily. As the female walks over the stems of the plants, she frequently touches the substratum with the tip of her abdomen, depositing a maggot." The life cycle of this parasite is discussed in detail.

Swenk, M. H. 1913. The principal insects injurious to agriculture during 1911-1912. Bull. State Entomol. Neb., 1:1-104.

The habits, life history, appearance, and food of the variegated cutworm, *Peridroma margaritosa saucia*, are described.

Swezey, O. H. 1937. Notes on potato insects in Hawaii. Proc. Hawaii Entomol. Soc., 9(3):433-435.
The greasy cutworm was present to some extent, feeding on weeds and also on the potato plants. When the potatoes were being harvested, tubers frequently were considerably eaten by them. As a demonstration of their eating capacity, a full-grown cutworm when placed with an uninjured tuber overnight ate a cavity as large as its own bulk. A few of the variegated cutworm were also found working similarly to the above. (433)

Tanada, Y. 1959. Descriptions and characteristics of a nuclear polyhedrosis virus and a granulosis virus of the armyworm, *Pseudaletia unipuncta* (Haworth) (Lepidoptera, Noctuidae). J. Ins. Path., 1:197-214.
"A nuclear polyhedrosis virus (*Borrelinavirus* sp.) and a granulosis virus (*Bergoldiavirus* sp.) of the armyworm *Pseudaletia unipuncta* (Haworth), have been described. Both viruses have been fed in combination to four of the above species (one of which was *Peridroma margaritosa*), without any infection occurring in these insects."

Thompson, B. G. 1926. Cutworm control in Oregon. Oregon Agr. Exp. Sta. Circ. 70: 1-6.
"There are more than 50 species of cutworms in Oregon. The most important are the variegated cutworm, *Lycophotia margaritosa* (Hubn.); the olive green cutworm, *Neuria procincta* (Grote.); and the greasy cutworm, *Agrotis ypsilon* (Rott.). The true armyworm does not occur in Oregon, but the variegated cutworm when unusually abundant assumes army habits, moving about in large armies in search of food." (3)

Thompson, B. G. 1935. Cutworm control in Oregon. Oregon State Coll. Agr. Exp. Sta. Circ. 3, p.3.
This is a reprint of the 1926 article by Thompson.

Thompson, C. G. 1951. A granulosis of the imported cabbageworm. J. Econ. Entomol. 44:255.
"A granulosis disease similar to those found in certain other insects such as the variegated cutworm, *Peridroma margaritosa* (Haw.), and the buckeye caterpillar, *Junonia coenia* Hübner, has been discovered in larvae of the imported cabbageworm, *Pieris rapae* Linn. The diseased caterpillars appeared in the second generation of insectary stock which originally came from adult female *Pieris* collected in Albany, Calif."

Tietz, H. M. 1936. A manual of the Noctuidae of Pennsylvania. Penn. Agr. Exp. Sta. Bull. 335:1-164.
The synonymy, distribution, life history, and food plants of the variegated cutworm, *Peridroma margaritosa*, are discussed. (25-26)

Tietz, H. M. 1951. The Lepidoptera of Pennsylvania. A manual. Penn. State Coll. Agr. Exp. Sta. 194 pp.
This manual lists references relating to classification and life history of Pennsylvania Lepidoptera. Food plants of these insects include field crops, forest trees, fruit trees, grass, shrubs, vegetables, ferns, and low plants. Locality records for Pennsylvania Lepidoptera are listed. (55)

Tietz, H. M. 1972. An index to the described life histories, early stages, and hosts of the Macrolepidoptera of the continental United States and Canada. A. C. Allyn, Sarasota, Fla. 1-2:1-1041.
This publication includes a list of periodicals, journals, bulletins, and memoirs which deal with lepidopterous life histories and host plants. It also contains a list of insect common names and another list of common names of plants upon which lepidopterous insects feed. The species names are listed alphabetically with synonyms, references dealing with life history, and food plants.

Timon-David, J. 1929. Recherches sur les matières grasses des insectes. Ann. Fac. Sci. Marseilles. Ser. 2, 4(2):122-123.
Lycophotia margaritosa Haw. was one of the insects involved in a study of fat bodies in insects. The author determined that an evaporated fat extract had a melting point of 33.5°, an iodine index of 130.6, and a saponification index of 193.5. (123)

Treat, A. E. 1975. Mites of moths and butterflies. Cornell Univ. Press. 132 pp.
A moth of *P. saucia*, taken at light Sept. 2, 1960, at Bussum, Netherlands, was observed to be of a peculiar red color. This color was found to be due to the presence of 227 mites almost all on the wing surfaces. The mites were identified as *Cheletomorpha lepidopterorum* (Shaw). (240) *Leptus* sp. was also a parasitic mite found on *P. saucia*. (223)

Treat, A. E. and K. D. Roeder. 1959. A nervous element of unknown function in the tympanic organs of moths. J. Ins. Physiol., 3:262-270.
"The B neurone is in close anatomical relation with the nerve fibers coming from the scoloparium. No direct interaction with the acoustic elements has been demonstrated, and the function of the cell remains unknown. A B neurone has been found in every noctuid species examined. A histological preparation was made from *Peridroma margaritosa* (= *saucia*) Haw.

Treherne, R. C. 1914. Report from Vancouver District: insects economically important in the Lower Fraser Valley. Proc. Entomol. Soc. Brit. Col., 4:19-33.
"The cutworms (*Peridroma saucia*, Hbn.; *Eupsephopoectes procinctus*, Grt.) are both recorded for the Lower Fraser Valley. These troublesome insects are known to all, and at times, in years of prevalence, become very destructive. They can be controlled when their damage is observed by the use of a mixture of bran, molasses, and Paris green. The worms as a rule only feed at night, so if this mixture is placed near the plants in the evening, many cutworms will suffer from the effects of the arsenic." (30)

Treherne, R. C. 1915. Shade tree and ornamental insects of British Columbia. Proc. Entomol. Soc. Brit. Col., 7:35-41.
Lycophotia saucia was among the more important insects found on shade and ornamental trees in British Columbia. (38)

Treherne, R. C. 1915. The insectivorous habits of the mole in British Columbia. Agr. Gaz., 2(3):216-217.
The moles *Scapanus townsendii* and *Neurotrichus gibbsii* were predaceous on *Lycophotia margaritosa* (*Peridroma saucia*) during an outbreak of the latter in the Lower Fraser Valley of British Columbia in 1914. Variegated cutworms damaged red currants, cabbages, mangels, and turnips.

Treherne, R. C. 1916. A preliminary list of parasitic insects known to occur in Canada. 46th Annu. Rep. Entomol. Soc. Ont. 1915, pp. 1-232.

"*Peridroma saucia* Hbn. The Variegated Cutworm. *Meteorus vulgaris* Cress. Braconid. Rpt. Dom. Ent. Cen. Exp. Farm, Canada, 1900, p. 226. Fletcher, Vancouver, B. C." (189)

Treherne, R. C. 1917. The natural immunity or resistance of plants to insect attack. Agr. Gaz. Can., 4(10):855-859.
"When one is met with such features as the ..... distaste shown for black currants, lettuce, etc. by such an omnivorous insect as the cutworm, *Peridroma saucia* ..... one cannot help but wonder if it would be possible to utilize such features in the practical realms of agriculture."

Treitschke, F. 1825. Die Schmetterlinge von Europa. 5:414 pp.
The moth of *P. saucia* is briefly described in Latin and German. Appearance of the larva, life history, and distribution are discussed. The species also occurs in Austria and Italy. (149-150)

Ts'ai Hsü-Yü. 1962. Viruses of certain insect pests. Author's Abstr. of Thesis, Zin, Leningrad, pp. 1-12.
The author found that *Agrotis segetum* could be readily infected with polyhedral viruses of certain other moth species under laboratory conditions; namely, the viruses causing this disease in *Barathra brassicae* L., *Hadena sordida* Bkh., *Agrotis* (=*Peridroma*) *saucia* Hbn., *Polia oleracea* L., and *Phytometra gamma* L.

Tucker, E. S. 1915. Protecting cabbage and cauliflower from attacks by worms. La. Agr. Exp. Sta. Bull. 154, pp. 1-16.
The egg, larva, and moth of the variegated cutworm, *Peridroma saucia*, are figured. The occurrence and methods of control of cutworms in general are discussed.

Twinn, C. R. 1941. A summary statement concerning some of the more important insect pests in Canada in 1940. 71st Annu. Rep. Entomol. Soc. Ont. 1940, pp. 1-64.
The species involved in Vancouver Island and on the lower mainland and coastal areas to the north was the variegated cutworm, *Peridroma margaritosa saucia* Haw. Potatoes, peas, and general truck crops were totally defoliated in many cases. (54)

Twinn, C. R. 1942. A summary of the more important crop pests in Canada in 1941. Annu. Rep. Entomol. Soc. Ont., 72:42-56.
"There was not a recurrence of the severe 1940 outbreak of the variegated cutworm, *Lycophotia margaritosa* Haw., in British Columbia. Only scattered reports of damage were received in 1941." (50)

Twinn, C. R. 1946. A summary of the more important insect conditions in Canada in 1945. 76th Annu. Rep. Entomol. Soc. Ont. 1945, pp. 1-58.
In Ontario the only species of cutworm, with the exception of the armyworm, reported causing economic loss was the variegated cutworm, *Peridroma margaritosa* Haw., which damaged tobacco, tomato, and flower and vegetable garden crops in southwestern Ontario. It attacked tomatoes in several parts of the province, boring into the fruit and rendering it useless. (50)

U. S. DEPARTMENT OF AGRICULTURE COOPERATIVE PLANT PEST REPORT[1]

The Bureau of Entomology of the U. S. Department of Agriculture, in cooperation with the State Entomologists, Entomologists of the Agricultural Experiment Stations, State Departments of Agriculture, Agricultural Colleges, and other entomological agencies, organized an Insect Pest Survey in 1921. This survey attempted to assemble and disseminate all data on the distribution, seasonal and regional fluctuation of insect abundance, weather data as related to insect outbreaks, phenological data, and other miscellaneous information. Each year an annual digest of the important facts gathered during the past season was published in the form of Insect Pest Summaries.

From 1921 to 1950, this publication was entitled "The Insect Pest Survey Bulletin." This was not bound or indexed for the years 1942-1949. In 1951, the Bulletin was replaced by the "Cooperative Economic Insect Report," Vol. 1, No. 1, July 31, 1951. In February 1975, the Report was superseded by the "Cooperative Plant Pest Report." No explanation is given in these publications for the name changes.

1921. U. S. Dep. Agr. Insect Pest Surv. 1:155.
The variegated cutworm was reported to have caused serious damage to alfalfa and clover in Washington and Bolivar counties, Mississippi.

1922. U. S. Dep. Agr. Insect Pest Surv. 2:19.
Variegated cutworms destroyed tomatoes and peppers in Sinaloa, Mexico.

1923. U. S. Dep. Agr. Insect Pest Surv. 3:168, 212.
Variegated cutworms were not injurious in Nebraska. (168) Larvae were unusually abundant in Indiana. (212)

1924. U. S. Dep. Agr. Insect Pest Surv. 4:103, 144, 156, 164, 199.
Variegated cutworms were unusually abundant on alfalfa in Illinois. (164) In Portland, Maine, these larvae damaged carnations. (199) This species was unusually abundant on clover in Illinois. (164) There was a serious loss of corn caused by variegated cutworms in Grant County, Wis. (156) These cutworms were numerous on greenhouse lettuce in Smithville, Ohio. (144) Variegated cutworms were found on various crops in Indiana. (103)

1925. U. S. Dep. Agr. Insect Pest Surv. 5:232, 303.
Variegated cutworms damaged alfalfa in California and Iowa. (232, 303) Gardens were attacked in California. (303)

1926. U. S. Dep. Agr. Insect Pest Surv. 6:61, 92, 140, 141, 169, 333.
Variegated cutworms damaged alfalfa in Mississippi and Texas (92), Kansas (140), and South Carolina. (169) Larvae damaged cabbage in Mississippi. (92) Cutworms were found feeding on clover in Greenville, Miss. (141) Larvae caused serious damage to cotton in Mississippi and Texas (92) and South Carolina. (169) Variegated cutworms were found on hay in Kansas. (140) In Mississippi the larvae caused serious damage to onion plants, potatoes, and tomatoes. (92) In Oregon

[1]Issued by Plant Protection and Quarantine Programs, Animal and Plant Health Inspection Service, U. S. Department of Agriculture, Hyattsville, Md. 20782.

eggs were observed in the field and began hatching in March. (61) There was an unusual outbreak of the variegated cutworm in the Gulf region of Mississippi and Texas. (333)

1927. U. S. Dep. Agr. Insect Pest Surv. 7:158.
Variegated cutworm larvae were defoliating tomato plants and eating the heads of cauliflower plants in a greenhouse in Indianapolis, Ind.

1928. U. S. Dep. Agr. Insect Pest Surv. 8:70-71, 90, 144, 145.
Variegated cutworms damaged cabbage plants in Mississippi (70-71, 90) and South Carolina. (145) In Mississippi there were complaints of cutworm damage on corn. (144) Larvae were collected from sweet potato plants in Mississippi. (90)

1929. U. S. Dep. Agr. Insect Pest Surv. 9:56, 318.
Variegated cutworms were observed to be moderately abundant in Connecticut. (56) Larvae were very abundant and caused severe damage on alfalfa, corn, potato, tomato, wheat, and cabbage. (318)

1930. U. S. Dep. Agr. Insect Pest Surv. 10:84, 138, 139, 204, 262, 356, 440.
Variegated cutworms caused severe damage to alfalfa in Nebraska. (262, 440) The larvae caused injury to the foliage of calla and carnation in Indiana. (84) In Colorado cutworms were very abundant and injurious on celery. (356) Larvae caused serious injury to sweet pea in Mississippi. (138) In Indiana these cutworms damaged the foliage on tomato plants. (84) Adults were taken at blacklight traps in Oregon. (139, 204)

1931. U. S. Dep. Agr. Insect Pest Surv. 11:90, 91, 163-164, 247, 248, 323, 330-331, 641, 652.
Variegated cutworms damaged alfalfa in Mississippi (163-164), Nebraska (247), Kansas (248), and Wisconsin. (331) Cutworms were abundant on corn in Kansas (248) and Wisconsin. (331) Cutworms were very abundant in gardens and on grapes, orchards, peaches, and vetch in Kansas. (248) Larvae caused severe damage to commercial plantings of gladiolus in Carteret County, N. C. (90) Potatoes were attacked in Nebraska (247), Wisconsin (331), and Vigas, Vera Cruz. (641) Larvae were present on sweet clover in Nebraska (247) and Wisconsin. (331) In Benton County, Minn. variegated cutworms were abundant on tobacco. (331) Moderate numbers of moths were caught in bait pans in New Mexico. (91) In Missouri there was an abundance of pupae. (163-164) A severe outbreak occurred in June in the west central states and spread to the north central states in July. (323) Cutworms were present in small numbers in Tennessee. (330) Variegated cutworms were very destructive in the west central states. (652)

1932. U. S. Dep. Agr. Insect Pest Surv. 12:10, 44, 83, 131, 196, 252, 416.
Alfalfa fields were infested with variegated cutworms in Oklahoma (83), Iowa and Nebraska. (196) In Yamhill County, Ore., there was a local outbreak of cutworms on alsike. (252) Cutworm infestation of cabbage was moderate in Wiggins, Miss., (10) and very heavy in Chadbourn, N. C. (44) In Chadbourn, N. C., the heavy cutworm infestation also was affecting garden peas. (44) There was a local outbreak on red clover in Yamhill County, Ore. (252) Strawberries and tobacco were damaged by heavy infestations of cutworms in Chadbourn, N. C. (44) Larvae were abundant over the entire state of New Mexico. (83) There were considerable numbers present in western Illinois. (131) Variegated cutworms caused considerable damage over the north central states from Wisconsin to Montana and southward to Kansas and Tennessee. (416)

1933. U. S. Dep. Agr. Insect Pest Surv. 13:105, 106, 143, 145, 150, 246, 297.
Variegated cutworms caused severe injury to alfalfa in Mississippi (105), Arkansas (106), Missouri (150), and Colorado. (246) Larvae were in outbreak numbers on bur clover in Mississippi (105) and Arkansas. (106) Cutworms were unusually abundant on cabbage in Colorado. (246) Cotton was severely injured in Mississippi. (105) In Oklahoma larvae were moderate on garden crops. (106) Variegated cutworms were important pests of tobacco plants in Costa Rica. (143) Tomatoes were damaged by larvae in Colorado. (246) Cutworms were very abundant in Missouri and Tennessee. (105) Damage by variegated cutworms was reported from Virginia, Tennessee, and Missouri. (145) Cutworms were very abundant in middle and eastern Tennessee. (150) Larvae were very abundant and heavily parasitized in Missouri. (297)

1934. U. S. Dep. Agr. Insect Pest Surv. 14:92, 129, 176.
In Oregon variegated cutworms injured hops. (129) Larvae were quite abundant in tobacco sheds in Florida. (176) Valencia oranges were damaged by cutworms in California. Larvae were very abundant in Tennessee. (96)

1935. U. S. Dep. Agr. Insect Pest Surv. 15:29, 115, 220, 276, 331.
Alfalfa was damaged in Arkansas (115), Iowa, Oklahoma (220), and Nebraska. (276) In Kansas larvae were very abundant on barley. (29) An outbreak of cutworms was reported on bur clover in Arkansas. (115) Cutworms were unusually abundant on clover in Iowa. (220) In Nebraska the cutworms numbered in outbreak proportions on corn. (276) Variegated cutworms damaged flower gardens in Minnesota (220) and gladiolus buds in Alhambra, Calif. (115) The worst infestation of cutworms reported from Michigan was on oats. (331) In California they were killing buds on pear trees. (115) There was an outbreak on potatoes in Nebraska. (276) Larvae were very abundant on rye in Kansas. (29) In Orange County, Calif., cutworms were very abundant on tomatoes. (115) Truck crops were damaged in Minnesota. (220) Injury to wheat was severe in Missouri and cutworms were very abundant in Kansas. (29)

1936. U. S. Dep. Agr. Insect Pest Surv. 16:59, 60, 100, 165, 267.
Variegated cutworms were unusually destructive to alfalfa in Mississippi. (100) There was a serious outbreak of cutworms on celery near Cleveland, Ohio. (267) Cutworms were unusually destructive to cotton in Mississippi. (100) Larvae were present in grasslands in Kansas. (59) Cutworms were common on tomato vines in California (60) and were defoliating tomato plants in Nebraska. (165) Larvae were present in wheat fields in Kansas. (59) Moths were plentiful in Nebraska. (100)

1937. U. S. Dep. Agr. Insect Pest Surv. 17:74, 159, 160, 161, 217, 263, 275, 335, 340.
Alfalfa was damaged in Arkansas, Kansas (160), and Iowa. (217) Bur clover was seriously injured in Yazoo City, Miss. (217) Celery was damaged in Indiana and Michigan. (335-340) Cutworms were noted on cherry trees in Indiana. (217) Corn was destroyed in Kansas (160) and Wisconsin. (275) Larvae were taken from cotton in Mississippi. (159) Gardens were damaged in Kansas and Oklahoma. (160) Grain and hay were destroyed in Wisconsin. (275) Onions were damaged in Kansas. (160) Potatoes were destroyed in Wisconsin. (275) Strawberries were injured in Kansas. (160). Sweet clover was damaged in Iowa. (217) Tomatoes were damaged in California (74, 161), Indiana (335, 340), and Michigan. (335) Truck crops were injured in Oklahoma (160), Indiana and Michigan. (335) Wheat was damaged in Kansas. (160) There were heavy outbreaks of variegated cutworms in Wisconsin, Minnesota, Nebraska, and South Dakota. (263)

1938. U. S. Dep. Agr. Insect Pest Surv. 18:87, 91, 96, 145, 151, 152, 153, 159, 246, 449, 450.
Alfalfa was damaged in Mississippi (87, 91), Louisiana and Arkansas. (87) Bur clover was heavily infested in Mississippi. (91) Clover was injured in Illinois. (152, 159) Young cotton plants were damaged in Alabama. (153) Cowpea plants were infested in Georgia. (450) Field crops were attacked in Louisiana. (96) Greenhouse plants were severely damaged in Maine. (151) Oats were damaged in Mississippi, Louisiana, and Arkansas. (87) Cutworms were very abundant on Long Island, New York, in potato fields. (449) Tobacco was injured in North Carolina. (145) Cutworms were present on tomato plants in Georgia. (91) Cutworms were present in outbreak numbers in Tennessee. (153) Moths reached peak activity in May in Nebraska. (246)

1940. U. S. Dep. Agr. Insect Pest Surv. 20:3, 50, 78, 127, 142, 226, 227, 299, 372, 437.
Variegated cutworms infested lima beans in Oceanside, Calif., (3) and beans in Ohio. (226) Red beets were severely damaged in Oregon. (299) Sugar beets were attacked in California. (227) Clover was damaged in Oregon. (299) Field crops were attacked in the Salt River Valley, Ariz. (78) Garden crops were infested in Arizona (50) and Ohio. (226) Mustard was attacked in California. (227) Ornamentals were eaten in Arizona. (50, 78) Field peas were severely damaged in Oregon. (299) Potatoes were attacked in California (3) and Washington. (437) Rhubarb was defoliated and attacked in Washington. (437) Tomatoes were damaged in California (227) and Washington. (437) Truck crops were damaged in Arizona. (78) Purple vetch was damaged considerably in California. (142) Variegated cutworms were occurring in the San Francisco Bay area of California. (127) Heavy infestations were encountered in Prince Edward Island and Vancouver Island, Canada. (372)

1941. U. S. Dep. Agr. Insect Pest Surv. 21:38, 73, 151, 237, 397, 413, 502, 568, 630.
Alfalfa was damaged in Sacramento, Calif. (73, 237), Nebraska (237), Utah (397, 413, 502), and Wyoming. (502) Sugar beets were damaged in California. (73) Cauliflower and carrots were damaged in Utah. (502) Cutworms were moderately abundant on celery hearts in Minnesota. (502) Flax was damaged in Sacramento, Calif. (73) Cutworms were common in gardens in Kansas. (151) Lettuce was damaged in Utah. (502) Larvae were common on ornamentals in Arizona. (151) Tomatoes were severely damaged in Minnesota (568) and Washington. (630) Cutworms were collected from watermelons in California. (73) Larvae were observed on white clover in Nebraska. (237) Cutworms were common in Minnesota (151) and numerous in Georgia on dead grass, leaves and weeds. (38)

1952. Coop. Econ. Insect Rep. 2:5, 137.
Variegated cutworms were very abundant on wild winter peas in Washington County, Miss., and were unusually abundant on alfalfa, vetch, rough peas and white clover in Louisiana. (5) In Sussex County, Del., larvae were present on pepper plants. (137)

1953. Coop. Econ. Insect Rep. 3:26, 38, 83, 130, 253, 344, 368, 431, 453, 497, 558.
Alfalfa was damaged in Oklahoma (344, 368) and Nebraska. (497) Beets were damaged in the Lower Rio Grande Valley in Texas. (26) Table beets were attacked in Oregon. (558) Crimson clover and white clover were damaged in Louisiana. (253, 344) Variegated cutworms were fifth in economic importance on cotton in 13 southern states. (38) Larvae were common in gardens in Missouri. (431) In Ohio cutworms were feeding heavily on hay and grasses. (453) Legumes were damaged in

Missouri. (431, 453) Oats were damaged in Washington County, Miss. (83) Cutworms almost destroyed vegetables in the Cloudcroft-Mayhill area of New Mexico. (130)

From 1954 to 1976, the references on variegated cutworm were considered too numerous and so they are listed only by years, volume, and page numbers.

1954. Coop. Econ. Insect Rep. 4: 13, 49, 52, 56, 161, 175, 197, 213, 233, 252, 258, 267, 295, 306, 325, 351, 362, 374, 382, 387, 397, 405, 413, 425, 454, 460, 465, 477, 479, 507, 514, 533, 572, 695, 713, 741, 762, 769, 792, 918, 1009, 1032. Light traps: 159, 271, 290, 390, 418, 439, 466, 493.

1955. Coop. Econ. Insect Rep. 5: 7, 27, 31, 52, 95, 109, 114, 120, 172, 178, 198, 224, 232, 269, 290, 294, 310, 336, 352, 378, 400, 412, 427, 454, 480, 507, 538, 602, 708, 739, 1040, 1121. Light traps: 157, 169, 190, 227, 228, 256, 258, 277, 299, 326, 346, 347, 348, 368, 369, 392, 418, 444, 470, 500, 527, 556, 583, 610, 611, 637, 662, 663, 693, 694, 724, 755, 756, 782, 783, 808, 829, 854, 855, 874, 896, 918.

1956. Coop. Econ. Insect Rep. 6: 26, 65, 100, 106, 123, 131, 222, 234, 244, 248, 253, 265, 281, 366, 393, 400, 418, 427, 450, 476, 545, 719, 749, 848, 1119, 1135. Light traps: 88, 118, 146, 174, 199, 229, 251, 272, 288, 314, 315, 338, 359, 380, 432, 470, 498, 531, 596, 626, 651, 680, 704, 742, 772, 803, 832, 862, 880, 899, 919, 937, 956, 969, 986, 1000, 1016, 1030, 1045, 1060, 1072, 1083, 1112, 1129, 1142.

1957. Coop. Econ. Insect Rep. 7: 102, 103, 178, 201, 218, 232, 251, 254, 299, 322, 338, 353, 362, 371, 372, 394, 417, 437, 485, 506, 531, 551, 556, 572, 597, 722. Light traps: 5, 33, 57, 78, 95, 116, 138, 157, 176, 194, 215, 237, 256, 276, 310, 329, 346, 366, 387, 407, 430, 450, 474, 475, 500, 520, 521, 541, 542, 561, 562, 587, 609, 631, 632, 653, 674, 695, 696, 717, 732, 750, 766, 784, 889, 900, 909, 923, 947.

1958. Coop. Econ. Insect Rep. 8: 22, 44, 72, 81, 84, 108, 109, 138, 174, 221, 235, 303, 322, 344, 380, 405, 448, 455, 479, 485, 490, 506, 535, 540, 559, 588, 605, 634, 649, 693, 697, 737, 780, 783, 879, 945, 971, 985, 993, 997, 999, 1001, 1025. Light traps: 4, 56, 91, 106, 146, 190, 215, 238, 262, 283, 302, 328, 350, 372, 395, 396, 417, 418, 464, 465, 494, 495, 521, 550, 571, 572, 596, 620, 640, 641, 662, 682, 683, 706, 707, 729, 730, 749, 772, 792, 806, 825, 838, 839, 856, 869, 884, 898, 943, 957, 970, 983.

1959. Coop. Econ. Insect Rep. 9: 11, 12, 33, 96, 112, 137, 175, 196, 199, 204, 246, 256, 285, 294, 303, 311, 346, 377, 383, 401, 406, 454, 463, 478, 484, 495, 503, 535, 544, 568, 734. Light traps: 172, 195, 220, 240, 265, 290, 318, 339, 363, 395, 420, 421, 470, 471, 496, 524, 525, 557, 558, 590, 591, 613, 637, 638, 661, 662, 689, 690, 716, 717, 740, 741, 761, 762, 787, 788, 814, 815, 834, 835, 853, 854, 872, 890, 907, 923, 941, 969, 987, 1000, 1011, 1024, 1033, 1044, 1052, 1060.

1960. Coop. Econ. Insect Rep. 10: 126, 156, 162, 199, 227, 257, 273, 284, 354, 378, 395, 401, 432, 438, 454, 468, 487, 510, 560, 582, 617, 623, 653, 704, 735, 760, 803, 809, 816, 830, 850. Light traps: 5, 16, 44, 99, 120, 189, 240, 254, 293, 320, 340, 368, 392, 415, 450, 475, 501, 502, 538, 574, 606, 633, 665, 693, 722, 748, 775, 817, 903, 929, 952, 974, 1001, 1046, 1059, 1081, 1094, 1106, 1116, 1128, 1136.

1961. Coop. Econ. Insect. Rep. 11: 94, 105, 119, 168, 176, 177, 227, 291, 384, 398, 402, 421, 428, 431, 434, 448, 456, 475, 480, 482, 501, 508, 530, 550, 563, 597, 657, 663, 780, 1018. Light traps: 60, 79, 117, 148, 158, 201, 233, 270, 299, 327, 343, 362, 391, 411, 440, 465, 466, 490, 491, 520, 547, 548, 586, 587, 615, 616, 641, 642, 675, 676, 705, 706, 738, 739, 766, 767, 789, 790, 812, 813, 835, 836, 897, 922, 935, 956, 973, 995, 1027, 1038, 1051, 1061, 1100, 1111, 1119.

1962. Coop. Econ. Insect Rep. 12: 102, 154, 188, 202, 210, 229, 346, 457, 461, 467, 487, 490, 513, 534, 535, 550, 558, 756, 822, 893, 948, 1015. Light traps: 5, 42, 198, 288, 314, 392, 424, 449, 475, 503, 504, 536, 537, 576, 577, 604, 605, 644, 645, 675, 676, 711, 712, 746, 747, 779, 812, 813, 840, 841, 877, 878, 909, 910, 935, 936, 959, 960, 982, 983, 1082, 1090, 1103, 1121, 1145, 1161, 1174, 1192, 1204, 1218, 1238.

1963. Coop. Econ. Insect Rep. 13: 166, 175, 243, 255, 279, 455, 480, 512, 545, 553, 576, 582, 604, 650, 680, 716, 828, 917, 924, 953, 982, 987, 1011, 1401. Light traps: 259, 289, 326, 370, 407, 443, 473, 501, 534, 567, 568, 591, 626, 627, 661, 662, 696, 697, 734, 735, 771, 772, 805, 806, 841, 842, 876, 877, 884, 934, 935, 936, 937, 938, 967, 968, 969, 1001, 1002, 1032, 1033, 1034, 1062, 1063, 1090, 1092, 1123, 1124, 1412.

1964. Coop. Econ. Insect Rep. 14: 111, 131, 161, 163, 201, 212, 250, 261, 267, 269, 400, 433, 450, 464, 485, 501, 540, 541, 572, 608, 630, 685, 726, 803, 840, 905, 942, 993, 1013, 1025, 1227. Light traps: 8, 54, 81, 97, 117, 149, 181, 219, 246, 282, 320, 342, 383, 413, 452, 486, 525, 562, 591, 592, 632, 633, 669, 670, 704, 705, 741, 742, 743, 781, 782, 822, 823, 824, 854, 855, 856, 890, 891, 892, 922, 923, 924, 955, 956, 957, 984, 985, 1008, 1009, 1032, 1033, 1034, 1056, 1057, 1076, 1077, 1094, 1095, 1119, 1120, 1134, 1153, 1171, 1196, 1213, 1228, 1244, 1261, 1274, 1297, 1312.

1965. Coop. Econ. Insect Rep. 15: 19, 33, 136, 159, 174, 184, 195, 252, 335, 381, 412, 419, 442, 449, 454, 492, 503, 524, 536, 545, 566, 568, 572, 576, 600, 632, 648, 668, 720, 750, 757, 785, 825, 861, 891, 896, 897, 904, 928, 962, 966, 998, 1003, 1004, 1029, 1065, 1098, 1208, 1301. Losses: 434. Light traps: 7, 18, 39, 52, 66, 75, 88, 109, 129, 148, 181, 214, 249, 283, 311, 350, 392, 430, 460, 493, 528, 558, 559, 589, 626, 627, 660, 661, 700, 701, 735, 736, 769, 770, 771, 804, 805, 806, 838, 839, 840, 877, 878, 879, 910, 911, 912, 913, 947, 948, 949, 983, 984, 985, 1018, 1019, 1020, 1052, 1053, 1054, 1083, 1084, 1108, 1130, 1149, 1168, 1169, 1196, 1215, 1232, 1250, 1270, 1280, 1295, 1304, 1317, 1328, 1339.

1966. Coop. Econ. Insect Rep. 16: 56, 108, 132, 154, 178, 181, 186, 188, 190, 208, 258, 304, 305, 336, 362, 410, 411, 428, 437, 458, 485, 487, 501, 509, 511, 512, 541, 640, 751, 809, 1120, 1148, 1150, 1157. Light traps: 6, 19, 35, 54, 84, 101, 150, 175, 205, 226, 249, 285, 314, 347, 378, 399, 421, 432, 445, 450, 453, 459, 472, 529, 560, 593, 621, 657, 686, 715, 742, 764, 793, 821, 850, 872, 889, 912, 930, 947, 968, 982, 996, 1019, 1037, 1053, 1070, 1086, 1108.

1967. Coop. Econ. Insect Rep. 17: 139, 145, 159, 161, 183, 186, 206, 212, 219, 243, 278, 363, 384, 440, 442, 484, 507, 589, 645, 671, 701, 704, 765, 835, 849, 853, 856, 958, 1024. Light traps: 6, 18, 34, 63, 81, 94, 120, 136, 180, 203, 252, 297, 319, 353, 372, 394, 420, 451, 474, 495, 525, 526, 552, 553, 581-582, 606-608, 637-638, 661-662, 691-692, 718-719, 746-747, 775-776, 798-799, 823-824, 843, 861, 885, 901, 916, 931, 950, 964, 975, 989, 1016, 1028, 1037, 1048, 1059.

1968. Coop. Econ. Insect Rep. 18: 95, 109, 121, 139, 144, 156, 158, 160, 162, 168, 235, 307, 330, 332, 388, 411, 416, 417, 419, 434, 435, 439, 440, 441, 443, 466, 467, 490, 520, 547, 613, 642, 668, 695, 730, 731, 734, 758, 816, 818, 842, 862, 863, 877, 881, 882, 884, 901, 982, 1035, 1048. Light traps: 8, 17, 40, 56, 80, 96, 130, 154, 187, 210, 243, 262, 283, 317, 341, 367, 401, 429, 456, 482, 504, 535, 563, 601, 626, 654, 683, 716, 745, 778, 828, 852, 872, 891, 910, 929, 954, 968, 989, 1011, 1053, 1068, 1079, 1092, 1101, 1116, 1140, 1151.

1969. Coop. Econ. Insect Rep. 19: 59, 133, 151, 153, 160, 165, 167, 177, 180, 186, 325, 472. Light traps: 34, 45, 60, 73, 87, 175, 195, 218, 240, 269, 284, 294, 314, 326, 352, 369, 389, 407, 460, 481, 504, 532, 557, 586, 610, 633, 653, 672, 693, 709, 727, 746, 758, 769, 784, 796, 817, 829, 837, 847, 856.

1970. Coop. Econ. Insect Rep. 20: 167, 280, 337, 353, 368, 385, 443, 673. Light traps: 30, 174, 195, 215, 253, 286, 302, 316, 330, 344, 362, 376, 395, 415, 435, 456, 487, 507, 526, 548, 570, 571, 594-595, 614-615, 633-634, 649-650, 664-665, 679, 691, 705, 716, 726, 742, 751, 762, 778, 785, 793.

1971. Coop. Econ. Insect Rep. 21: 174, 184, 292, 374, 394, 431, 450, 451, 512, 561, 567, 584, 588, 617, 633, 659, 670, 672, 708. Light traps: 128, 164, 213, 237, 266, 298, 315, 329, 351, 366, 384, 404, 422, 440, 461, 482, 501, 518, 537, 556, 573, 595, 609, 626, 637, 666, 676, 689, 701, 715, 726, 735, 745, 758, 783.

1972. Coop. Econ. Insect Rep. 22: 138, 140, 269, 304, 332, 440, 501, 523, 542, 558, 560, 578, 637. Light traps: 9, 21, 111, 131, 186, 217, 233, 247, 263, 274, 284, 311, 324, 340-341, 364-365, 393-394, 416-417, 432-433, 446-447, 468-469, 488-489, 508-509, 532-533, 548-549, 568-569, 586-587, 608-609, 626-627, 645-646, 667-668, 687, 700, 715, 726, 742, 753.

1973. Coop. Econ. Insect Rep. 23: 285, 299, 319, 320, 339, 361, 399, 402, 423, 425, 427, 509, 512, 513, 560, 599, 619. Light traps: 170, 186, 205, 216, 230, 240, 260, 276, 292, 311, 328, 350-351, 369-370, 390-391, 411-412, 433-434, 453, 474-475, 496-497, 520-521, 544-545, 565-566, 586-587, 606-607, 626-627, 645-646, 661-662, 679, 692, 707, 718, 730, 745.

1974. Coop. Econ. Insect Rep. 24: 164, 172, 180, 181, 211, 212, 213, 274, 364, 379, 430, 483, 505, 521, 604, 605, 630, 698. Light traps: 134, 171, 204, 230, 252, 279, 307, 330, 350-351, 374, 397-398, 418-419, 439-440, 469-470, 493-494, 511-512, 528-529, 556-557, 586-587, 613-614, 637-638, 662-663, 684-685, 705-706, 729, 749, 763, 777, 791, 805, 816, 832, 846, 859.

1975. Coop. Plant Pest Rep. 25: 146, 218-219, 225, 369, 411, 438, 441, 443, 460, 463, 484, 504, 506, 533, 553, 597, 621, 622, 643, 662, 665, 686, 701, 702, 705, 706, 758. Light traps: 81, 99, 136, 175, 212, 245, 271, 297, 336, 356, 377, 398, 421, 422, 452, 473-474, 495, 496, 523-524, 544, 545, 565, 566, 584, 585, 606, 607, 629, 630, 651, 652, 673, 674, 694, 695, 712, 713, 730, 731, 750, 751, 763, 775, 787, 797, 815, 823, 832, 847, 876, 901.

Urbahn, E. and H. Urbahn. 1939. Die Schmetterlinge Pommerns mit einem vergleichenden Überblick über den Ostseeraum. Macrolepidoptera. Stett. Ent. Ztg., 100:185-826. This is a faunal list of the Macrolepidoptera of Pomerania, which is a historical region located in northeast Mecklenburg, Germany, on the Baltic Sea between Rugen Island and the Vistula River. *Rh.* (*Agrotis* O.) *saucia* Hbn., (=*P. saucia*) appeared at Pomerania in September in 1909 and 1916.

Valencia-V, L. and R. Valdivia-M. 1973. Noctuideos del Valle de Ica, sus plantas hospederas y enemigos naturales. Revista Peruana de Entomol. 16(1):94-101.
Peridroma saucia was collected from tobacco in Arrabales and Santa Rita, Peru. This species requires control on tobacco in the Balle de Ica. The larvae attack seedling tobacco and cut off the crown, thus destroying the plant (100). In Peru natural enemies were *Velardemyia ica* and *Meteorus* sp. (Braconidae).

van der Geest, L. P. S. 1967. Biochemical changes in larvae of the variegated cutworm, *Peridroma saucia* (Hübner) (Phalaenidae) after infection with a nuclear polyhedrosis virus. Dissert. Abst. Sect. B, 27(9):3134B.
The total solids content of hemolymph plasma of healthy *Peridroma saucia* larvae and larvae infected with a nuclear polyhedrosis virus was determined on a dry weight basis. A statistically significantly lower total solids concentration was found in the diseased larvae, starting 4 days after infection. The protein concentration of the hemolymph of male larvae was lower than that of the females. Several transamination reactions were studied in fat body homogenates of healthy and diseased larvae. A statistically significant increase was found for glutamic-oxalacetic and glutamic-pyruvic transaminase activities in the fat body of diseased larvae.

van der Geest, L. P. S. and R. Craig. 1967. Biochemical changes in the larvae of the variegated cutworm, *Peridroma saucia*, after infection with a nuclear polyhedrosis virus. J. Invert. Path., 9(1):43-54.
"Nuclear-polyhedrosis-virus infection causes a decrease in total solids contents of the hemolymph of larvae of the variegated cutworm, *Peridroma saucia*. This decrease is partially caused by a decrease in hemolymph protein concentration and in free amino acids during the disease. An increase was found in the concentration of certain keto acids after infection. Nuclear polyhedrosis also causes an increase in transaminase activity in the fat body and in the intact organism. The amino-acid composition of the combined inclusion-body and virus-particle proteins was determined and found to be very similar to that reported in the literature by other workers." (43)

Wadley, F. M. 1921. Life history of the variegated cutworm. J. Econ. Entomol., 14:272-277.
A complete description of the life history of the variegated cutworm, *Lycophotia margaritosa*, is given.

Wakeland, C. C. 1920. Variegated cutworm, *Peridroma saucia*, Hubner. 11th Annu. Rep. Colo. State Entomol. for 1919, pp. 17-19.
In Delta County, Colorado, in 1919 variegated cutworms were found to be preventing the third crop of alfalfa from growing. Methods of control were tried. Four species of parasites were reared from variegated cutworm pupae.

Walkden, H. H. 1943. Cutworm and armyworm populations in pasture grasses, wastelands, and forage crops. J. Econ. Entomol., 36(3):376-381.
Of the 24 species of larvae trapped, *Peridroma margaritosa* was the second most abundant. The relationship between the population and the type of field is discussed. A list of parasites and hosts is given.

Walkden, H. H. 1950. Cutworms, armyworms, and related species attacking cereal and forage crops in the Central Great Plains. U. S. Dep. Agr. Circ. 849:1-52.
The distribution, economic status, food plants, larval habits, seasonal history, life cycle, reproductive capacity, and natural enemies of the variegated cutworm, *Peridroma margaritosa* (Haworth), are discussed.

Walkden, H. H. 1943. Differential damage to sweet clover varieties by the variegated cutworm. J. Econ. Entomol., 36(3):470.
Different varieties of clover were damaged in varying degrees by *Peridroma saucia*. Estimates of the percentages of defoliation of 28 varieties are shown in a table.

Walkden, H. H. 1937. Noctuidae taken at a bait trap in Kansas. Ann. Entomol. Soc. Amer., 30(2):296-303.
Over a period of 11 years (1921-1931), collections were made at a bait trap. Seventy-two species of Noctuidae were taken during the 11-year period, but only five of these species appeared in the trap for the 11 consecutive years. *Lycophotia saucia* was recorded every year. Of the ten most abundant species taken in the trap, five were involved in outbreaks in Kansas during the 11-year period. *Lycophotia saucia* was one of these species.

Walkden, H. H. and D. B. Whelan. 1942. Owlet moths (Phalaenidae) taken at light traps in Kansas and Nebraska. U. S. Dep. Agr. Circ. 643:1-26.
The variegated cutworm was one of the seriously injurious insects found at light traps in Kansas. Peak abundance of *Peridroma saucia* occurred in mid-season, followed by comparative scarcity in the fall. Seasonal distribution studies indicated three generations of *saucia* occur each year at Manhattan, Kansas.

Walker, F. 1856. Catalogue of Lepidoptera heterocera. List of the specimens of Lepidopterous insects in the British Museum. 10:337-338.
The author described *Peridroma saucia* Hübner as two new species, *Agrotis impacta* and *Agrotis intecta*. The *impacta* were from Brazil and Venezuela while the *intecta* were from Montevideo, Uruguay.

Walker, F. 1857. List of the specimens of lepidopterous insects in the collection of the British museum. Part 10. Noctuidae:311.
The adult of the variegated cutworm is described as *Agrotis saucia*. Synonyms given include *Noctua saucia* Hbn., *Peridroma saucia* Hbn., *Noctua aequa* Geyer, and *Agrotis aequa* Steph.

Walker, F. 1857. Catalogue of Lepidoptera heterocera. List of the specimens of Lepidopterous insects in the British Museum. 11:738.
The author described *Peridroma saucia* Hübner as *Agrotis ambrosiodes* and believed it was a new and separate species. The specimen was from Mr. Stevens' collection in Colombia and Venezuela.

Walker, F. H. 1936. Observations on sunflower insects in Kansas. J. Kans. Entomol. Soc., 9:16-25.
This paper records a list of insects found in Kansas on both wild and cultivated sunflowers (*Helianthus* spp.) by the writer, with some observations on those causing the greatest amount of damage. (16) "*Lycophotia margaritosa saucia* Hubner, (variegated cutworm): These cutworms were found feeding on the foliage during the outbreak of 1931. An average of 7 to 12 larvae were found in the soil at the base of each plant." (19)

Wallengren, H. D. J. 1860. Wiener entomologische. Monatschrift, 4:169.
The moth of *P. saucia* is described as a new species, *Noctua flavicosta*, in Latin. (169)

Walton, W. R. 1946. Cutworms and their control in corn and other cereal crops. U. S. Dep. Agr. Farmers Bull. 739(rev.):1-7.
Numerous complaints of the ravages of cutworms, including *Peridroma saucia* especially in relation to corn, are received each season. The life history and control measures of cutworms are discussed. The moth, caterpillar, and egg mass of the variegated cutworm are figured.

Walton, W. R. 1917. How to detect outbreaks of insects and save the grain crops. U. S. Dep. Agr. Farmers Bull. 835:1-24.
Type of injury, seasonal history, and control methods for cutworms are discussed briefly. The egg, larva, and moth of *Peridroma margaritosa* are figured. (11-13)

Walton, W. R. 1929. Cutworms on golf greens. U. S. Golf Assoc. Green Sec. Bull. 9(9):156-157.
"Sodlands constitute the natural home of many of the most injurious species of cutworms inhabiting the United States east of the Mississippi River. It should not cause surprise when they are found feeding on golf greens in large numbers. An instance of this kind is reported in this issue of the Bulletin. It occurred on the greens at the experimental farms, Arlington, Va., in which attention was focused on the matter through the useful agency of insectivorous birds. Fortunately the cutworm pest is one which can be rather easily eliminated in the great majority of cases by the application of simple poisoning methods, herein described." (156)

Walton, W. R. and J. J. Davis. 1916. Cutworms and their control in corn and other cereal crops. U. S. Dep. Agr. Farmers Bull. 739:1-3.
This is a revision of an earlier bulletin dealing with the life histories of *L. margaritosa* and other cutworms (Farmers Bulletin 731).

Walton, W. R. and C. M. Packard. 1940. The armyworm and its control. U. S. Dep. Agr. Farmers Bull. 1850:1-12.
"The variegated cutworm (*Peridroma margaritosa* (Haw.)) often occurs in large numbers along with the armyworm where legumes are present, especially in alfalfa fields containing much grass. This insect, rather than the armyworm, is often responsible for the greater part of the damage to alfalfa and other legumes. Fortunately the two insects can be effectively controlled together by the use of poisoned-bran bait." (7)

Ward, I. M. 1943. Report of the provincial entomologist. Brit. Col. Dep. Agr. Rep. 38:R66-R72.
"The variegated cutworm (*Lycophotia margaritosa*) severely injured a cabbage crop at Lavington, but the outbreak was very local in nature." (R70)

Washburn, F. L. 1903. Injurious insects of 1903. Minn. Agr. Exp. Sta. Bull. 84: 1-184.
The egg, larva, and moth of the variegated cutworm, *Peridroma saucia*, are figured. Remedies are discussed. (69-70)

Washburn, F. L. 1903. Injurious insects of 1903. Annu. Rep. Minn. State Entomol. 8:1-184.
This is the same as the preceding publication which includes a discussion of cutworms in general.

Waters, H. 1937. Methods and equipment for laboratory studies of insecticides. J. Econ. Entomol., 30(1):179-203.

Equipment, materials, and methods used for rearing *Lycophotia margaritosa* are described. (199-201) Leaves of mangel and perpetual spinach were used as food for the most part in rearing this species.

Waters, H. A. 1943. Rearing insects that attack plants. Laboratory Procedures in the Studies of the Chemical Control of Insects. Amer. Assoc. Adv. Sci. Pub. 20:1-28.
"Variegated cutworm. This species can be reared by much the same technique as the southern armyworm. It is more difficult to obtain eggs from the variegated cutworm. Do not put more than eight pairs in an oviposition cage. Egg laying is better if a small tomato or potato plant is present in the cage. Be sure that the larvae for the rearing stock receive the best of care to insure large vigorous adults. The adults survive better if they have access to fresh 5% sugar solution. Young larvae of this species tend to scatter more than southern armyworm and must be kept in closed cages. Larger larvae can be kept in open cages." (14)

Watson, J. R. 1914. Tomato insects root-knot and "white-mold". Fla. Agr. Exp. Sta. Bull. 125:57-78.
Cutworms are mentioned as attacking newly set tomato plants. Two species, *Lycophotia* (*Agrotis*) *saucia* and *Mamestra chenopodii*, are figured. (66)

Webster, F. M. 1905. The principal injurious insects of 1905. Yearbook Dep. Agr.: 628-636.
"The variegated cutworm (*Peridroma saucia* Hbn.), probably the most destructive of all cutworms, attracted attention in North Dakota and Oregon from its injuries to various vegetable and ornamental plants." (629)

Webster, F. M. 1906. The principal injurious insects of 1906. Yearbook Dep. Agr.: 508-517.
"The variegated cutworm (*Peridroma saucia* Hbn.) was destructive in California, did mischief in greenhouses in Minnesota, and injured vegetable crops and berries in Alaska and Mexico." (511)

Webster, F. M. and W. Newell. 1902. Insects of the year in Ohio. U. S. Dep. Agr. Div. Entomol. Bull. 31:1-103.
"Carnations in the experiment station greenhouses suffered severely in March from the attacks of cutworms (*Peridroma saucia*) which fed on the petals and burrowed into the unopened buds, working chiefly at night." (86)

Webster, R. L. 1912. Insects of the year 1912 in Iowa. J. Econ. Entomol., 5(6): 469-472.
Peridroma margaritosa saucia Hübn. This was reported as damaging alfalfa under the name "armyworms" but turned out to be the "variegated cutworm" which occasionally becomes so abundant that it adopts the habits of the true armyworm. Considerable local damage was done. The larvae were found to be heavily parasitized by Tachinid flies. (471)

Webster, R. L. 1915. Potato insects. Iowa Agr. Exp. Sta. Bull. 155:357-420.
The variegated cutworm, *Peridroma margaritosa* Haw., is described and figured. (391) The life history is also discussed. (392)

Weed, C. M. 1891. Insects and insecticides. Pub. by author, Hanover, N. H. 281 pp.
The variegated cutworm larva and adult are illustrated as examples of cutworms attacking cabbage. (197)

Weigel, C. A. 1923. Insect enemies of chrysanthemums. U. S. Dep. Agr. Farmers Bull. 1306:1-36.
"The variegated cutworm in greenhouses, in addition to the usual cutworm habit of cutting off young plants near the surface of the soil, or severing the stems a little higher, as well as feeding on the tender leaves of plants more advanced in growth, attacks the flower buds of chrysanthemums and carnations and eats out the centers, thus spoiling the blossoms." Types of injury, life history, control, and prevention of cutworms are discussed briefly. (17-18)

Weigel, C. A. and L. G. Baumhofer. 1948. Handbook on insect enemies of flowers and shrubs. U. S. Dep. Agr. Misc. Publ. 626:1-115.
Appearance, food plants, type of injury, and control methods of insect pests are described briefly. *Peridroma margaritosa* is one of the most common species of cutworms attacking ornamentals. (2-3)

Weigel, C. A. and E. R. Sasscer. 1923. Insects injurious to ornamental greenhouse plants. U. S. Dep. Agr. Farmers Bull. 1362:1-81.
The variegated cutworm, *Lycophotia margaritosa*, which is an omnivorous feeder found in gardens, pastures, vineyards, and orchards, is the species which most frequently occurs in greenhouses.

Weiss, H. B. 1916. The more important greenhouse insects. N. J. Agr. Exp. Sta. Bull. 296:1-42.
The egg, larva, and moth of *Peridroma saucia* are figured. Appearance, injury, food plants, life history, and control methods of the variegated cutworm are discussed. (7-8)

Weldon, G. P. 1914. A light trap for catching cutworm moths. Calif. State Comm. Hort. Mon. Bull., 3(7):284-285.
An acetylene gas burner in a globe attracted as many as 7,000 moths in a single night in California. Most of the moths were the common cutworm, *Peridroma saucia*.

Wheeler, A. G., Jr. 1975. Insect associates of *Ginkgo biloba*. Entomol. News, 86 (1 & 2):37-44.
"*Peridroma saucia* (Hübner). Egg mass July 8, State College; reared to maturity on ginkgo in laboratory." (40)

Wene, G. P. 1954. Control of some lepidopterous larvae which attack vegetables. Proc. Eighth Annu. Rio Grande Valley Hort. Inst.:41-48.
In control experiments of the variegated cutworm on seedling cotton with low volume sprays, the author found toxophene and heptachlor equally effective and both slightly more effective than aldrin. (43)

Whelan, D. B. 1926. Cutworms. Market Growers Journal, 38:85-86.
"In Canada it is said that the annual loss from cutworms amounts to hundreds of thousands of dollars. During the year 1900, one species alone, the variegated cutworm, destroyed crops in British Columbia valued at $168,000, while the losses in other provinces would make it more than $200,000. That same year Dr. F. H. Chittemden, a government entomologist, estimated the total damage caused by the species of cutworms in the United States and Canada at the enormous sum of $2,500,000. Another cutworm, called the armyworm, has done a considerable amount of damage in the central states during the past few years." (85)

Whipp, A. A. 1950. Control of the variegated cutworm on red beets. Proc. N. Cent. Br. Entomol. Soc. Amer., 5:21.

Severe infestations of the variegated cutworm, *Peridroma margaritosa* (Haw.), occurred in red beet fields in southeastern Wisconsin during the summer of 1949. Experiments conducted on a 20-acre commercial beet field approximately 25 days prior to harvest showed that this insect could be effectively controlled with either DDT (wettable powder) or chlordane (emulsion) when applied at the rate of 1 lb. per acre in 100 gallons of water. The DDT and chlordane gave 97% and 89% reductions, respectively.

Whipp, A. A. and R. K. Chapman. 1951. Control of the variegated cutworm on red beets with DDT and chlordane sprays. J. Econ. Entomol., 44(3):430.
A severe infestation of *Peridroma margaritosa* (Haw.) occurred in red beet fields in southeastern Wisconsin during the summer of 1949. Since no recent work had been reported on the control of the variegated cutworm, it was necessary under these outbreak conditions to determine a specific control for this insect. The data showed that the insect was effectively controlled with either DDT or chlordane sprays when applied at the rate of 1 lb. of actual toxicant per acre.

Whitcomb, W. D. 1928. An experiment in trapping cutworms. J. Econ. Entomol., 21(4): 592-598.
This study indicates that traps may be used to determine time and abundance of different cutworms, including *Lycophotia margaritosa*. During rainy and cold cloudy weather, the number of cutworms collected decreased. (595-596)

Wilbur, D. A. and R. L. Parker. 1951. Alfalfa insects. *In* Alfalfa in Kansas, Kans. Agr. Exp. Sta. Bull. 346:1-65.
The variegated cutworm was found to be most damaging to alfalfa in Kansas during June. (57)

Wilcox, J. and A. F. Howland. 1946. Results of field experiments with DDT against insects affecting tomatoes in southern California. U. S. Dep. Agr. Bur. Entomol. and Plant Quar., E-699:1-8.
"Tomato plants and fruits are attacked commonly in southern California by several species of insects and related pests." *Peridroma margaritosa* is one of the more important insect pests. Insecticides were applied with hand dusters. The best control obtained for cutworms was a 10% DDT dust mixture.

Winters, N. E. 1925. Manual para el cultivo del algodonero en la República Argentina. Argent. Minist. Agr. Circ. 539:54-56.
The gusano jas peado (*Peridroma margaritosa* (=*saucia*)) is described as a pest of cotton. The life cycle and control of cutworms in general is also described. (54-55) (Translated from Spanish.)

Wittig, G. 1966. Egestion time in two species of caterpillars. Ann. Entomol. Soc. Amer., 59(1):39-42.
"The egestion times of two instars of the salt-marsh caterpillar, *Estigmene acrea* (Drury), and three instars of the variegated cutworm, *Peridroma saucia* (Hübner), were studied by feeding two vegetables alternately. The mean egestion times observed ranged from 1-1/2 to 8-1/4 hours. Differences between the two vegetables for a certain instar and the differences among the instars for a given vegetable were evaluated." (39)

Woglum, R. S. 1926. Seasonal helps on insect pest control problems. Calif. Citrograph, 11:264-265.

An outbreak of the most common cutworm, the variegated cutworm, caused damage to oranges. It was introduced into America from Europe prior to 1840 and is now distributed throughout the continent. The egg, larva, and moth of the variegated cutworm are figured.

Woglum, R. S. and H. C. Lewis. 1935. Notes on citrus pests new or seldom injurious in California. J. Econ. Entomol., 28:1018-1021.
"In the field, a number of other species of worms were incidentally associated with the *Xylomyges* larvae, especially on the cover crops. However, the one species largely responsible for damage to citrus, both in 1934 and 1935, was *Xylomyges*. Among the other species present was *Lycophotia margaritosa* (Haworth), the variegated cutworm. In a few groves in 1935, this species became abundant and damaging enough to cause concern. This applied also to southern California, where it has previously been reported on citrus by the senior author." (1020)

Wolff, N. L. 1970. A revised list of the Lepidoptera known from the Faroe Islands. Entomol. Meddelelser, 38(1):3-14.
Peridroma saucia was collected at Eysturoy, Faroe Islands, on Oct. 1, 1955, but was considered an immigrant species. (12)

Wressell, H. B. 1971. A survey of insects infesting vegetable crops in southwestern Ontario 1969. Proc. Entomol. Soc. Ont., 101:13-23.
The variegated cutworm, *Peridroma saucia*, was one of the principal cutworms frequently appearing in outbreak numbers on sweet corn. (16-17)

Zangheri, S. 1951. Contributi alla conoscenza dell' Entomofauna delle Leguminose da seme. Nota preventiva sull' entomofauna del pisello e della fava. Boll. Instituto. Entomol., 18:1-100.
This article contains a list of insects affecting broad bean and pea seed crops in Italy. *Rhyacia margaritosa* Haw. in Italy attacks cereals, flax, apples, and tobacco. Two generations occur in Italy. The number of generations in northern France, south-central Europe, and the United States are discussed. (99-100) (Translated from Italian.)

Zelensky, V. 1938. Contribution à l'étude de *Rhyacia saucia* Hbn. (Lépid. Noct.). Rev. Zool. Agr., 37(7-8):103-112.
The egg, larva, pupa, and adult of *Rhyacia* (=*Peridroma*) *saucia* Hbn. are described in detail. The life cycle is described and two generations each year were recorded in French Morocoo. (Translated from French.)

Zelensky, V. 1938. Contribution à l'étude de *Rhyacia saucia* Hbn. Rev. Zool. Agr., 37(7-8):120-122.
The author describes the egg, larva, pupa, and adult of *Rhyacia* (=*Peridroma*) *saucia* Hbn. Larval and ovipositional behavior are also discussed. (Translated from French.)

Zerny, H. 1927. Die Lepidopterenfauna von Albarracin in Aragonien. EOS, Revista Española de Entomol., 3:299-488.
Agrotis (*Lycophotia, Rhyacia*) *saucia* Hbn. was abundant from May to September in northeastern Spain. (365) (Translated from German.)

Zimmerman, E. C. 1958. Insects of Hawaii. A manual of the insects of the Hawaiian Islands including an enumeration of the species and notes on their origin, distribution, hosts, parasites, etc. Macrolepidoptera. Univ. Haw. Press, 7:542.
The variegated cutworm: Hawaiian name for caterpillar: poko. The distribution, host plants, and parasites are given for the variegated cutworm. The predators are mentioned. (289-291)

Index

This index was prepared on the computer from keywords indicated on the index card file. Information may be retrieved by author's name (left-hand column) and year (right-hand column); larval description, life history, outbreak, geographical distribution, etc. The Canadian Insect Pest Review is abbreviated as CIPR, the Insect Pest Survey as IPS, and the Cooperative Economic Insect Report as CEIR.

ANONYMOUS. ALFALFA ARGENTINA* ANONYMOUS 00910 1926
ANONYMOUS. COTTON CHEMICAL-CONTROL* ANO 01310 1958
ANONYMOUS. POTATOES SPAIN* ANONYMOUS. P 01110 1926
ANONYMOUS. CANADA TOBACCO* ANONYMOUS. C 01510 1973
ANONYMOUS. SPAIN POTATOES* ANONYMOUS. S 01210 1941
ANONYMOUS. NOVA-SCOTIA TOBACCO* ANONYMO 01410 1972
ANONYMOUS. CANADA OUTBREAK NEW-BRUNSWICK 01010 1926
APPLE CLIMBING-CUTWORMS* ROCK. APPLE CL 39010 1975
APPLE* FLETCHER. ONTARIO APPLE* FLETCH 17310 1901
APPLES PEAS BROAD-BEANS* ZANGHERI. ITAL 56410 1951
APPLES* FELT. NEW-YORK CLOVER APPLES* 16410 1915
ARCHYTAS-ANALIS PARASITES* ALLEN. ARCHY 00510 1926
ARCHYTAS-ANALIS PARASITES* SWEETMAN. AR 46610 1936
ARGENTINA COTTON* WINTERS. ARGENTINA CO 55810 1925
ARGENTINA FAUNAL-LIST* SCHAEFER. ARGENT 40610 1942
ARGENTINA SYNONOMY* KOHLER. ARGENTINA S 27810 1963
ARGENTINA* PASTRANA. CORN ARGENTINA* P 36210 1968
ARGENTINA* ANONYMOUS. ALFALFA ARGENTINA 00910 1926
ARGENTINA* CRISTOBAL. PARASITE ARGENTIN 12110 1947
ARIZONA ALFALFA* MORRILL. ARIZONA ALFAL 33810 1913
ARIZONA ALFALFA* MORRILL. ARIZONA ALFAL 34010 1920
ARIZONA CELERY* FLOCK. ARIZONA CELERY* 17810 1946
ARIZONA* FREEMAN. ALFALFA OUTBREAK ARIZ 18610 1914
ARKANSAS COLORADO IPS. COSTA-R 50210 1933
ARKANSAS CABBAGE* CIPR. ARKANSAS CABBAG 07210 1944
ARKANSAS LOUISIANA MAINE ALABAMA* IPS. 50710 1938
ARKANSAS POPULATION-ABUNDANCE* LINCOLN. 28810 1945
ARKANSAS SEASONAL-DISTRIBUTION* SELMAN. 41310 1972
ARKANSAS SEASONAL-DISTRIBUTION* HARREND 22910 1959
ARTICHOKE CALIFORNIA* LANGE. ARTICHOKE 28010 1941
ASPARAGUS BRITISH-COLUMBIA* CIPR. ASPAR 07110 1942
ASPARAGUS NEW-JERSEY POTATOES* MERRILL. 32410 1956
ASPARAGUS* CIPR. BRITISH-COLUMBIA TOMAT 08410 1956
ATKINS. CITRUS CALIFORNIA* ATKINS. CITR 01610 1959
AUSTRIA ITALY* TREITSCHKE. AUSTRIA ITAL 48410 1825
AUSTRIA SYNONYM* SCHAWERDA. AUSTRIA SYN 40910 1929
AVOCADO CALIFORNIA* EBELING. AVOCADO CA 15610 1953
AVOCADO* EBELING. CALIFORNIA AVOCADO* 15710 1959
B-NEURONE* TREAT. TYMPANIC-ORGANS B-NEU 47710 1959
BACILLUS-THURINGIENSIS PATHOGENS* STEIN 45210 1951
BADE. LARVAL-BEHAVIOR LIFE-CYCLE* BADE. 01710 1931
BAERG. LARVAL-ILLUSTRATION ALFALFA CLOVE 01810 1942
BAIT-TRAP KANSAS* WALKDEN. OUTBREAKS BA 51810 1937
BALKANS FAUNAL-LIST* REBEL. BALKANS FAU 37810 1904
BARLEY BUR-CLOVER IPS. MICHIGAN IOWA 50410 1935
BAYER-22408 ORGANO-PHOSPHORUS* BOYD. BA 03910 1960
BEADLE. WISCONSIN ECONOMIC-IMPORTANCE* 01910 1938
BEAUVERIA-BASSIANA* GABRIEL. FUNGUS-INF 19310 1959
BEET OATS TEXAS* CEIR. CLOVER-WHITE CLO 51110 1953
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BLICKENSTAFF. COMMON-NAMES* BLICKENSTAF 02610 1965
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BRITISH-COLUMBIA OUTBREAK* RUHMANN. BRI 39610 1941
BRITISH-COLUMBIA POPLAR-SILVER FIR-DOUGL 42010 1958
BRITISH-COLUMBIA* WARD. CABBAGE BRITISH 53310 1943
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BRITISH-COLUMBIA SHADE-TREES* TREHERNE. 48010 1915
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BRITISH-COLUMBIA* CIPR. TOMATOES BRITIS 08110 1953
BRITISH-COLUMBIA CABBAGE OUTBREAK GEOGRA 08310 1955
BRITISH-COLUMBIA TOMATOES ASPARAGUS* CI 08410 1956
BRITISH-COLUMBIA POTATO CUCUMBER* CIPR. 08510 1957
BRITISH-COLUMBIA OUTBREAK* CIPR. POTATO 08610 1958
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CABBAGE NOVA-SCOTIA* CIPR. CABBAGE NOVA 09810 1971
CABBAGE OUTBREAK GEOGRAPHICAL-DISTRIBUTI 08310 1955
CABBAGE POTATOES* MACKENZIE. NOVA-SCOTI 30410 1950
CABBAGE SWEET-POTATO MISSISSIPPI SOUTH-C 49710 1928
CABBAGE TOMATO* IPS. CONNECTICUTT WHEAT 49810 1929
CABBAGE* CIPR. BRITISH-COLUMBIA CABBAGE 08810 1960
CABBAGE* CIPR. ARKANSAS CABBAGE* CIPR. 07210 1944
CABBAGE* DAVIS. ILLINOIS CABBAGE* DAVI 13310 1911
CAESAR. ONTARIO LIFE-HISTORY* CAESAR. O 05210 1927
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CALIFORNIA* LANGE. ARTICHOKE CALIFORNIA 28010 1941
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CALIFORNIA* GOEDEN. MILK-THISTLE CALIFO 21410 1971
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CALIFORNIA* WELDON. LIGHT-TRAP CALIFORN 54910 1914
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CAMPOLETIS-PERDISTINCTUS* LINGREN. PARA 28910 1970
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CANADA* MACNAY. CANADA* MACNAY. CANADA 31010 1948
CANADA* SPECHT. TOBACCO CANADA* SPECHT 44110 1973
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CATALOGUE* WALKER. BRAZIL VENEZUELA SYN 52310 1856
CAULIFLOWER WYOMING IPS. UTAH* IPS. 50910 1941
CAULIFLOWER LOUISIANA* TUCKER. CABBAGE 48610 1915
CAULIFLOWER NOVA-SCOTIA* CIPR. CAULIFLO 05710 1924
CAULIFLOWER TOMATO* DAVIS. INDIANA CAUL 13510 1928
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CEIR. CLOVER-WHITE CLOVER-CRIMSON BEET O 51110 1953
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CIPR. ONTARIO TOMATO* CIPR. ONTARIO TOM 07310 1945
CIPR. ONTARIO TURNIP OUTBREAK* CIPR. ON 07610 1948
CIPR. ONTARIO TOMATO* CIPR. ONTARIO TOM 07410 1946
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CIPR. POTATOES ONTARIO* CIPR. POTATOES 09710 1970
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CIPR. POTATO BRITISH-COLUMBIA OUTBREAK* 08610 1958
CIPR. POTATO TOMATO BRITISH-COLUMBIA OUT 08710 1959
CIPR. PRINCE-EDWARD-ISLAND BRITISH-COLUM 06910 1940
CIPR. PRINCE-EDWARD-ISLAND TOBACCO* CIP 06710 1938
CIPR. SASKATCHEWAN GREENHOUSE* CIPR. SA 06010 1928
CIPR. SUGAR-BEET BRITISH-COLUMBIA* CIPR 09210 1964
CIPR. SYNONOMY TOBACCO ONTARIO* CIPR. S 09010 1962
CIPR. TOMATOES BRITISH-COLUMBIA CABBAGE 08310 1955
CIPR. TOMATOES ONTARIO* CIPR. TOMATOES 07810 1950
CIPR. TOMATO ONTARIO* CIPR. TOMATO ONTA 09610 1968
CIPR. TOMATOES BRITISH-COLUMBIA* CIPR. 08110 1953
CIPR. TOMATOES PEAS ONTARIO OUTBREAK* C 08210 1954
CIPR. TOMATO ONTARIO* CIPR. TOMATO ONTA 09110 1963
CIPR. TOMATO NEW-BRUNSWICK* CIPR. TOMAT 06410 1935
CIPR. TOMATOES BRITISH-COLUMBIA* CIPR. 05810 1925
CITRUS CALIFORNIA* ATKINS. CITRUS CALIF 01610 1959
CITRUS CALIFORNIA* WOGLUM. CITRUS CALIF 56110 1935
CITRUS* MACKIE. CALIFORNIA CITRUS* MAC 30510 1935
CLIMBING-CUTWORM* SAUNDERS. FRUIT-PESTS 40510 1883
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CLOVER APPLES* FELT. NEW-YORK CLOVER AP 16410 1915
CLOVER CONTROL-METHODS* MORGAN. TOBACCO 33710 1910
CLOVER CORN* BETHUNE. OUTBREAKS ONTARIO 02310 1908
CLOVER PACIFIC-NORTHWEST* ROCKWOOD. ALF 39110 1926
CLOVER* BAERG. LARVAL-ILLUSTRATION ALFA 01810 1942
CLOVER* IPS. WISCONSIN MAINE ILLINOIS O 49310 1924
CLOVER* IPS. MISSISSIPPI ALFALFA CLOVER 49010 1921
CLOVER-CRIMSON BEET OATS TEXAS* CEIR. C 51110 1953
CLOVER-LADINO* HOGG. MISSISSIPPI TOXAPH 25510 1951
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COLLECTION* CRETSCHMAR. GERMANY COLLECT 12010 1955
COLOMBIA VENEZUELA* WALKER. SYNONYM MUS 52510 1857
COLORADO IPS. COSTA-RICA* IPS 50210 1933
COLORADO CELERY LETTUCE* GILLETTE. COLO 21210 1924
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COLORADO* WAKELAND. ALFALFA COLORADO* 51710 1920
COLORADO* COCKERELL. SUNFLOWER COLORADO 10910 1915
COLORADO* MICKLE. FRUIT-PESTS COLORADO* 32910 1951
COMMON-NAME* ANDERSON. COMMON-NAME* AN 00610 1975
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CORN MISSOURI* STEDMAN. CORN MISSOURI* 44810 1906
CORN NEBRASKA* MUMA. CORN NEBRASKA* MU 34210 1946
CORN PEAS* MILLIRON. DELAWARE CORN PEAS 33110 1958
CORN* BETHUNE. OUTBREAKS ONTARIO PEACH 02310 1908
CORN* GIBSON. ONTARIO TOMATOES CORN* G 20810 1923
CORN* IONESCU. ROMANIA CORN* IONESCU. 26510 1962
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COTTON OUTBREAK POTATO MISSISSIPPI 49510 1926
COTTON TEXAS* SANDERSON. COTTON TEXAS* 40310 1906
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COTTON* DORMAN. MISSISSIPPI COTTON* DO 14810 1941
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COTTON* FENTON. OKLAHOMA ALFALFA COTTON 16510 1938
COTTON* LOWRY. INSECTICIDAL-EVALUATION 29710 1952
COTTON* PIERCE. CONTROL-METHODS COTTON* 36910 1917
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COTTON* WINTERS. ARGENTINA COTTON* WIN 55810 1925
COTTON* WENE. VEGETABLES INSECTICIDAL-E 55110 1954
COUDRIET. SYNTHETIC-DIET REARING-MEDIUM* 11910 1970
COWPEA ARKANSAS LOUISIANA MAINE ALABAMA* 50710 1938
CRETSCHMAR. GERMANY COLLECTION* CRETSCH 12010 1955
CRISTOBAL. PARASITE ARGENTINA* CRISTOBA 12110 1947
CROP-LOSSES* WHELAN. ECONOMIC-IMPORTANC 55210 1926
CROWDING STRESS-FACTOR* STEINHAUS. CROW 45610 1958
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CRUMB. CLIMBING-CUTWORMS HOST-RANGE* CR 12710 1932
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CRUMB. LARVAL-KEY LARVAL-DESCRIPTION* C 12810 1956
CRUMB. TOBACCO EGG-KEY LARVAL-KEY PUPAL- 12610 1929
CRUMB. TOBACCO TENNESEE* CRUMB. TOBACCO 12410 1926
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CUCUMBER* CIPR. BRITISH-COLUMBIA POTATO 08510 1957
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